

RECORD

J. R. Fosberg

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• 9

(Fitter, 25 years - Fitter, 45 years)

(1884-1914)

new one was a grand.

Collection and Field Note Book
No. 61
(March 24, 1961 - June 25, 1961)
(41723 --- 41861)

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F. R. Fosberg
Field Note Book # 61
beginning with # 41723
ending with # 41861.



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Mar. 25 - Kipulka Puanla
 0.1 mi. on truck road on right
 in grassy opening -
 8 Hibiscadelphus trees
 of varying sizes up to
 4 m. tall planted in a
 group. Several of them
 seem to be rather chlorotic
 and dying back from tips -
 these in sun. ~~These~~ in shade
 look better, but of these,
 the 2 largest seems to be
 affected by a mosaic
 similar to that on *Gossypium*
tomentosum. One flowering & fruiting.

- 1 small "Aca"
- 1 small *Pisonia*
- 1 small *Alpinia*
- 4 ~~too~~ healthy *Pittosporum* horneri
- 1 *Hibiscus brackenridgei* (1.3 m) leafless
- 2 "Papala" 1 small *Kokia*.

Clearing surrounded by
 large *Sapindus*, one or two large
Lehua, ^{a number of} ~~several~~ *Mysms* sp.
 clumps of *Riptinus*, one or two
 small *Psychotria*, 2 *Pelea* sp.; several
Kophea.

Thicket of kau saplings by
 road.

Weeds: *Pasp. dilatatum*, *Cyperus brevifolius*,
Mentha spicata, *Holcus*, *Verbena*
bonairensis, *Cynodon dactylon*,
Commelinia diffusa, ¹ *Bonchus* sp.
carvensis?, *Ranunculus* sp.,
Pteridium *Rubus penetram* around edges.

geranium
carolinianum

2

1961 Hawaiian Is.

March 23 - Captain Cook,
South Kona

- 41723 *Hibiscus brackenridgei* v. *hawaiiensis* Cunn.
cultivated in garden of Amy Greenwell

400 m.



Hawaii

3

depressed spreading plant;
flowers butter yellow with
maroon center.

- Mar. 24 - Kealikakua, South Kona
24 *Bambusa medicana* v. *bipinnatifida*
planted generally around
houses, no tendency to escape
noted.

450 m.

shrub 3-4 m. tall; flowers
white. lvs. tending to
be folded, a few with
lower pinnae trifoliate.

Mar. 24 - Kanepulehu Forest Reserve,
North Kona

640 m.

twines, flowers with calyx
whitish, petals yellow,
narrowly triangular with
blunt apex.

culms solitary, ascending.

- 25 *Cocculus*
locally common in openings.

tree 8 m. tall; fruit
immature.

- 26 *Cyperus hillebrandii* Benth.
common

twining vine; flowers maroon,
standard with white spot
and lines at base. (fruit
from different plant, nearby).

- 27 *Colubrina oppositifolia*
occasional

tree 6 m. tall.

- 28 *Canavalia galeata* var.
occasional in open

small tree 5 m. tall,
spreading, much branched,
corolla light maroon; fruit
immature

- 29 *Nothocestrum breviflorum* Gray
occasional

- 30 *Diospyros sandwicensis* var. *pubescens* Forb.
^{ferruginea} dominant tree

- 31 *Asplenium adiantum-nigrum* L.
rare, in rock crevices

- 4 1961 Hawaiian Is.
- 41732 *Asplenium trichomanes*
rare, in rock crevices
- 4 33 *Osteomeles anthyllidifolia* (Sm.) Lindl.
occasional
- ✓3 34 *Hicyos*
rare, in opening
- 3 35 *Korthalsella cylindrica*
abundant locally on
Diospyros fereana
- 4 36 *Pouteria*
rare
- 4 37 *Cocculus*
local
- 1 38 *Kobria duguetioides rockii* Lewt.
rare
- 1 39 *Peperomia leptostachya*
common in rock crevices
- 2 40 *Argemone alb glauca* var. *inermis* Deg.
rare in opening
- 4 41 *Sida fallax*
very common in openings
- 3 42 *Chenopodium oahuense*
very common, especially in openings
- 3 43 *Mototrichium sandwicense*
very common
- 3 44 *Lipochaeta*
rare in opening
- 3 45 *Xylosteum barbigerum* Hillebrandii Wawra
rare

- Hawaii 5
- tree 3 m. tall; fruit immature.
vines creeping over ground;
flowers whitish.
- joint cylindric; branches
decussate; flowers all around
nodes.
- tree 8 m. tall; buds and
young growth rusty brown.
- twiner; ~~calyx~~ - whitish;
petals yellow at base,
white distally, narrowly
triangular, emarginate at apex.
- slender tree 5 m. tall:
involucral bracts patent,
stiff, purple above, green
with reddish veins beneath.
- stem and leaves fleshy
- order of fls.
like stalk erect, very glaucous, 1.7 m.
pre-pinnation
- tall, sap yellow; petals white.
- ~~scrub~~ slender shrub 1.3 m. tall,
branched; calyx maroon;
corolla orange with red
centers.
- erect shrub, 2 m tall,
- somewhat disagreeable odn
small tree, 3 m. tall,
grayish.
- sterile small tree with
drooping branchlets.

- 6 Feb 1961 Hawaiian Is.
- 41740 *Fenestraria mikanoides* Otto
4 occasional in openings
- March 24 - ^{15'} mi. ^{nw} of Kailua,
on road to Waimea
- in dry & open forest on aa lava
- 4 47 *Canthium odoratum*
common
- 3 48 *Diospyros fenzlana* var. *pubescens* Fock.
abundant
- Mar. 24 - Puu Huluhulu,
Hamakua saddle
- 1 49 *Bromus rigidus*
locally abundant in grassy slope
- 1 50 *Poa pratensis*
locally common on grassy slope.
- 2 51 *Rubus macracai?*
locally abundant in tree forest
- 3 52 *Coprosma montana* var. *montana* H.Bd. ♀
3 53 *Coprosma montana* var. *montana* fruit
3 54 *Coprosma* " " ♂
base of cinder cone at edge of lava flow
- Mar. 25 - Kipukapuaulu, Hawaii National Park
- ~~in~~ open areas with scattered trees 1225 m.
- 3 55 *Fumariaceae* *Hydrocotyle sibthorpioides* var. *oedipus* Deg.
locally abundant in grass in
- 1 56 *Pipturus*
local around margin
- 1 57 *Pipturus albidus* (H. & A.) Gray
under trees
- Hawaii
- 7
- twiner; flowers yellow.
- 600 m.
- small tree 4 m. tall;
leaves glossy; fruit immature.
- small tree 5 m. tall;
fruit immature.
- 2100 m.
- forming dense masses
1.5 m. tall; petals rose purple.
- shrub 1.5-2.5 m. tall.
- shrub 2-3 m. tall.
- shrub 2 m. tall.

Mar. 25. Riuilea Paauwa
Regular trail.

Goes in through tall
lehua forest, rather open.
Around edges Dodonaea
and Styphelia bushes
and grass.

From top of first small
rise mixed mesophytic
forest with lehua,
Sapindus, Sophora
Psychotria, Osmanthus,
Cupressus, Myrsine, Pipturus

one small planted Kohia on edge
Main canopy layer here
is mostly lehua with
some Sapindus.

under story Cupressus,
Psychotria, Osmanthus
~~Ficus~~

Fragaria on ground.
patches of Microlepia
Geranium, Commelinaceae [in open]

Soon Sapindus becomes
dominant in canopy.

Understory more or less
same, but with Pismire.

Then open park-like
area, with Sapindus
not nearly so tall, one or
two tall lehuas, one Persia. +
clump of Hibiscus. Sophora.
abundant bracken, with
grass (Anthoxanthum, Holcus,
Paspalum dif.)

Cupressus + Psychotria + Pipturus
saplings strictly under
Sapindus + lehua.
Some masses of Microlepia
and Pipturus.

Gouldia tree on st. marked
by stake 17, type tree of one
of my new forms.

On Pelea, several Sophora
Myrsine, all rather small.

Entering another small
pastureland, thru Sapindus
strip. a thicket of large
Sophora on left, good
isolated trees.

Just above trail here is
a sapindus with a good
mass of epiphytic Peperomia
reflexa on side away from trail.

Photos - 3 of Lehua forest at entrance, both dense and sparse (away from path), several in flatland, incl. Gouldia tree, one of hoa. general view, then 2 more of hoas.

finds roll on open Lehua-hoa next roll, Trix - shots in forest of Lehua trunks, views, Ectotum microlepis. Views above & below had in Lehua for.

Then mixed Lehua-hapindus with Charpentiera, Coprosma, Psychotria, Sopelia in understorey.

ground largely bare except masses of Nephrolepis and Microlepia and a large mass of Peperomia - 2 forms of P. reflexa, large on ground, small on tree trunk side by side. (stake 24)

Then into open parts like Lehua worth some hoa, some Coprosma and Sopelia, Dipturus grass and Nephrolepis exaltata (golden pubescence on rachis but blunt lvs.).

Pteridium is generally abundant with Cyrtodactylus, Anthoxanthium, Pasp. dil., Veronica plebeja.

Rather dense Lehua forest with understorey of Coprosma, Psychotria, Dipturus, Osmanthus, Pelea

strawberries and Poa on ground, locally Microlepia & Pteridium, much bare ground. Hymen. Hypolepis?

On side trail giant hoa 4 times my arm spread around, perhaps 25 m. tall.

Above trail - Lehua forest with little undergrowth, below with much, esp. Coprosma.

Photos - large Lehua trunk with enormous forms, views in Lehua forest, end roll of Peperomia reflexa ground cover. Most open part, with Parsonsia, Stransia, Coprosma & Dipturus in understorey. Myrsine, Osmanthus, Sophora.

Then on rt. generally dense *Lapindus* & *lehua* / with thick under story, on left more open, lehua then *brosa* savanna.

Then on rt. *Lapindus*, *lehua*, parkland. some *Psythotria* etc. under bigger trees. Trail goes into this and it gets closer - typically open forest.

Hibiscadelphus planted on right, flowering and fruiting well. 3 m. tall.

Smaller one above it, more glabrous, marked *Hibiscus giffardianus*. *Hibiscus brackenridgei* planted 30 yds. below it.

Then, mixed mes.-fruit on rt., *brosa-lehua* savanna on left.

Mar. 25 - path to crater rim across from KMC.

Scrub of *Styphelia*, *Vaccinium*, stunted *lehuas*, *Dodonaea*.

Polypodium pellucidum on left in low *lehua* bushes. rt. also. Several *Laddeia* becoming common toward the crater rim.
Mar. 26 - same.

On open spaces of bare ground *Coryza canadensis* var. *guilla* and *Bulbostylis capillaris* are very common. The latter is found anywhere where there is loose ash of a sandy texture.

Coming to the rim on awesome view of a solidified lake of swirling lava presents itself, with the gaping pit of Halemaumau in the middle distance.

Tiny tufts of vegetation are scattered over this lava, and plumes of steam rise here and there. Sections of the cliff rim are separated by great cracks and seem about ready to fall in to the crater.

(to page 17)

Mar. 26 Flat in front of
Wentworth House, Han. Nat. Park.

Scattered lehua up to
about 8 m. tall, spaced
2-6 m., trunks up to 8-10 cm.
dbh.

Ground generally covered
by Gleichenia.

A few Ilex and Lantana
scattered in this, much
smaller than the lehua.

Astelia common. Machaerina
fairly common. Lycopodium
cernuum common. Smilax
occasional. Dubautia
scabra and Dubautia
occasional.

Vaccinium reticulatum
very common. 1 up to 4 dm.
tall; Styphelia tam.
common, up to $\frac{2}{3}$ m. usually
to 0.5.

Saddleria cyath. common.
one small colony of Rubus
seen.

Coprosma ericoides
local in thin places in the
Gleichenia.

Sacciolepis occasional.
another grass rare, (coll.)

~~Phragmopis~~ ~~Phragmopis~~ rare.

Gahnia gahniaeformis var.

Hypochaeris radicata rare

Fragaria nov.

Vaccinium fabulace? ~~ell. c.~~

Vacc. calycinum nov.

Polypod. pellucidum var.

Diavella common

Uncinia var.

Letaria sp. 1. Holms 1.

The above description
applies to a strip about 100 m.
from the cliff base. It is
cut by many cracks.

Out from this the
lehua are larger, more
widely spaced. Between
them is a rather open scrub,
irregular, 0.3-1, rarely 2 m.
(the shrubs over 1 m. are young
lehua), of Styphelia,
Vaccinium ret. Dodonaea,
lehua.

In addition there are,

a. Sadleria

c. Pteridium

v. Lyc. com.

o. Letaria

c. Hypochaeris rad.

cl. Fragaria

c. Hypericum jap.

c. Deschampsia

c. Sporobolus (with some)

oc. Phragm. grandiflora

oc. Polypod. pell.

o. Rubus penetrans

c. Comosma erod.

Cladonia is common on ground. 1 *Andropogon* clump seen.

Farther out the *Lobelia* is closer together again

A straight swath has been cut through this to below the cummin house from

The effect of this road may be foreseen by observing the land along the present dirt road running in from the front corner of KMC. and crossing this

Grasses have spread in for about 12 m on either side. Other weeds also.

Mar 26 Crater Rim Trail from front of KMC.
turn left -

The vegetation here is the same loose scrub of *Styphelia*, *Vaccinium*, *Dodonaea*, *Saddleria*, and *Polypodium*, with scattered small *Metrosideros*. On the *Brachis* *saddleria* is abundant. The plant with linear hard grass like leaves is *Macraea* *angustifolia*. Tangled *Gleichenia linearis* var. *Tomentosa* is common a bit away from the rim.

The large yellow flowers are *Oenothera stricta*, the smaller ones *Hypochaeris radicata*. *Dubautia* is the small shrub with conspicuously 6 ranked short lance-oblong leaves. It has small yellow heads in clusters when in bloom. *Cyperus*

is an occasional weed along the trail, as is *Andropogon virginicus*, *Isporobolus elongatus* and *Saxiolepis contracta*. A native tussock-forming

grass, not so common,
is *Deschampsia*.

The abundant soft
red berries are *Vaccinium*
reticulatum (wholo) and
are quite edible.

The trail follows the
rim, a few feet from it.
Some variation may be
noted in the lehuas - a
bright green bush is on
the right a short distance
down the trail - but most
of the trees are the common
var. *virgata*, which colors
ash and lave.

As the trail goes down
a short defile *Sphenomeris*
chinensis, *Nephrolepis*
exaltata, ~~and~~ *Wikstroemia*
sp. ~~spes~~ and *Gahnia*
gahniiformis may be
seen together on the banks
to the left.

On the slightly lower
level at the bottom of this
the vegetation generally
is much sparser and
lichens cover much of
the ground.

A few yards along from
this are distant and direction
signs.

Among the weedy grass
along this trail is
the common ~~but~~ European
^(and several others) *Anthoxanthum odoratum*,
familiar in many parts
of the world, also *Leymus*
geniculata.

If the *Vaccinium* fruit
is ripe great variation in
size, color, and taste will
be evident.

Just before the trail
comes out onto the steaming
flats *Gleichenia linearis*
becomes abundant on the
right, with *Lycopodium*
ceratum, the strange
little tree-like plant
with hanging cones on
the tips of its branches and
long runners arching
between the erect fruiting
stems.

The mat-like grass in
the trail, with unpleasant
tiny needle-like fruit, is
Chionopogon aciculatus.

On the steaming flats
the vegetation becomes
very low and dwarfed.

The lehuas, now very
widely scattered, are
less than about 1 m. tall.

everything else is less than half that. The abundant gray moss that shares the bare spots with the lichens is the widespread

In the first steam crack, on the right dwarfed *Sphagnum* and *Nephrolepis* may be seen lining the edges. (Experiment with smoke)

In the second opening *Paspalum orbiculare* is common, and *Pityrogramma calomelanos*. The right hand branch of the trail follows a great steam crack filled with luxuriant *Nephrolepis* cf. *biserrata*. Carpet grass (*Andropogon compactus*) lines the margin and is abundant out on the flats.

The small purple flowered herb in the cracks is *Cyperus caeruleocephalus*.

The Hawaiian *Luzula* (?) *campestris* var. is also here.

Clumps of *Andropogon* and several of *Arundinaria* and *Spathoglottis* are found back of the steaming bluffs to be. The stems are ~~at~~ *Gleichenia*.

bluff largely bare & vegetation at the top, is just to the right of the trail. Below it a slope of lava covered by lehua and *Gleichenia*.

The trail down to the caldera floor may be seen opposite across the curve in the cliff.

Then another large steam crack on left.

At ~~the~~ intersection there is a choice of three trails.

~~Crossing~~ the one to the right, enters a low open lehua forest with an abundant tangled ground layer of *Gleichenia*. ~~Crossing~~ a large crack a good growth of *Nephrolepis exaltata* (or *N. hirsutula*) may be seen on the right of the trail.

The next crack is a large one and in it a giant *Thelypteris* fern.

In the next one a slender *Pteris* and *Pityrogramma* in addition to the common ferns. *Spathoglottis* *plicata* in the crack and along the trail.

The under story gradually

changes from Gleichenia
to Sadleria cyathioderma

Wikstromia is occasional,
as well as Coprosma (glab.)

Before the third ridge
Eupatorium riparium has
gained a foothold.

On the right *Dicranzia*

100 m or so beyond this ridge
the sandalwood trees for
which the trail is named
may be seen. Their broad
leaves and yellow green color
identifies them (L. van.).

In it before them *Smilax*
sandy, twining over a tree
at the rt. *Coprosma*
enodocides forms masses "gr."
Glaucium *luteum* bottom
a small tuft on a tree.
Astelia *menziesii*
on ground beneath the
Smilax.

If the Santalum is
in flower its delicious
odor may be noted.

Beyond the Santalum,
on the left ~~is~~ the small
bamboo-like grass is *Isachne*
listiophylla, representative
of an important Pacific genus.
The silvery leaves of *Astelia*
are just beyond. By the

next ridge, with
Wikstromia.

This forest is a fairly
well developed lehua forest
and represents a stage
toward the giant forests
to be seen on older lavas.
The abundance of Lycopodium,
Sadleria, *Machaerina*,
and Gleichenia shows that
it is still a relatively
young forest. It may
be noted that as yet there
are ~~few~~ tree ferns, though
or ~~some~~ may be seen farther
in the front of the left.

Paspalum conjugatum
and *Cyperus compressus*
along trail.

The great crack on the
left shows that the section
of the crater rim on which
the trail ~~of runs~~ ^{may be} destined,
sometime, to fall into the
caldera. Lycopodium
cernuum is unusually
abundant (Degen's story).

As the trail descends
and starts along a ledge
on the cliff ^{edge} *Smilax* is
on cliff's right

In the distance ahead
may be seen the bare new
cinder cone at Kilouea Iki, formed
in 1959.

Andropogon glomeratus
on edge of cliff, also *Psidium*
aquileinum along trail.

Andropogon virg. ~~on left~~.
Saxolepis contracta
and *Holorhynchus elongatus*
(smutty one) along trail. Below

Fragaria along trail.

Trail out on shelf away
from cliff on left! then
turns down to left of
foot of cliff where
Haleakalānā trail
branches off in taller
lehua forest with more
Absinthium.

Trail climbs scrub
covered cliff to left.
Kantauhi on cliff
with small lehua
and *Dodonaea*. Weedy
grasses along and above trail.
Eupatorium riparium.
Hypericum japonicum

Spectacular cliffs,
~~out~~ caldera flora, and
Bryozoan ledge to rt.

On cliff to left a
ginger prob. *Hedychium*
gingerbier yumbet (or *Hedychium*?)
Also *Lithrum maitense*
by steps. *Cyperus brevifolius*
in rt. tall virginia

Volcanic
House

Shrub with stiff pointed
leaves is *Hedychium glomerata*
var. *centranthoides*.

Fuchsia magellanica ~~on~~
~~left~~ at slender shrub
~~along~~ overhanging trail.
above narrow defile
tree ferns, *Cibotium cham.*
(harm). At end of
defile, on rt. *Cryptandra*
cf. *cordifolia*.

Under of tall *Cibotium*
~~abundant~~ ~~abundance~~ of *Hedychium* sp.
and mat of *Delagnella* sp.
Tritoma, *Commelinis diffusa*.

Climbing trail - *Psidium*
catl. single slender sapling
to rt. Mat of *Hypericum*
jap. on ground along side
of trail. Lehua forest gets lower.
Hedychium glom. very common
in ~~upper~~ ^{upper} part of slope
in ~~open~~ low lehua forest.

On left after trail levels
off. *Coprosma* - small lf. pub.
twigs).

Scattered *Cibotium*, forest
more open. Tangles of *Gleichenia*.
Intersection. Trail to rt. to
park HQ. *Hedychium*
abundant. Escaped Rose
Eriogon karwinskianum
Tritoma, *Eupatorium*, *Commelinis*,
abundant. Torch ginger. *Heterocentron*?

Foot Path Volcano House & KMC.

Through a sparse young
osa planting ~~into~~ⁱⁿ weedy
grass area.

Erigeron sp., *Tritoma*,
Gymnelia, *Cyperus breviflorus*,
Cynodon dactylon, *Rubus*
penetrans, *Rosa* (Baby rose)
Cyperus compressus, *Paspalum*
dilatatum, *Cyperus* sp.

Desmodium uncinatum
Bidens pilosa, *Sacciolepis*
contracta, *Anthosanthus*
odonalurus, *Hypochaeris radicata*,
Chrysanthemum, *Pennisetum clandestinum*,
Holcus lanatus.

Tritoma forms great
masses by veg. repud.

At end of meadow a
clump of ornamental Rhodo-
dendron mt., Tibouchina on
left, on rt. a thicket of
Morus sp. and Tibouchina,
Hedychium, *Pandanus* quique,
a slender bamboo.

Enter open lehua wood,
with *Hedychium* and Tibouchina

Road leads in to Sulphur Bank,
to rt. through open lehua
with *Gleichenia*, forming
deep tangles, with *Lyc. corn.*

Off road to left a small
trail leads to ^{now} of steaming
vents with sulphur
deposited on earth and on
plants.

Across from this, at end of
road, is a spectacular
deposit of sulphur on a
steaming bank practically
devoid of vegetation.

In front of this is a
flat with very low
vegetation - *Gleichenia* dis.
Lyc. cornum, *Pasp. orbicularis*
Luzula, a few small lehua
and *Dodonaea*, to 1.5 m. tall.
Ecclettites val. (purple) (rare)
(*Arundinaria* ~~can~~)

- ♂ *Styphelia*
- ♂ *Vaccinium reticulatum*
- ♂ *Andropogon virg.*
- ♂ *Sphenomerus chinensis*
- ♀ *Spathoglottis*
- ♀ *Gahnia gahniaeformis*
- c *Cyperus* sp. (compr.?)
- b *Dodonaea*

Much bare ground in
center of ^{burned down} ~~burned down~~
center with sparse
depressed *Fimbristylis dichotoma*,
Dodonaea, gray moss, clathrus,
Waltheria (r.), *Sacciolepis*,
Couya can. patches of *Neph.*
exalt. (dwarfed), *Sphenomeris*,

along trail Gleichenia
gradually dominates.
on. Macraeiing any.
becoming commoner. Lehus
becomes common.

Forest to left.

Then lobosina and
along trail, Hypericum sp.
Throlobius elong.

thin strip of lehus
forest with abundant
Sallens.

to open Gleichenia
tangles with scattered
small lehus.

to steaming flats, with
great steam cracks.

Right fork at sign
thru low Gleichenia
Lys. corn. Galins., Vac
Dodonaea, gray moss mottled
giving way to low
Gleichenia tangles.

Pluchea odorata in trail.

Nephrolepis cf. hirsutula
locally abundant.

esp-around steam vent.

Trail skirts inner
edge of flat along edge
of forest, thin Gleichenia
tangles.

Small trail to left
into moss covered flat

with Melinis clumps,
large erratic boulders
(thrown by 1924 eruption?)
back to trail which
continues through
Gleichenia, patches
of open ground with
lehus and moss. low
Vacc. Dod. Styrph. weeds.
More Gleichenia.

Cordyline to rt. at foot
of low cliff scarp.

Where trail turns toward
low cliff some Combus
sch. var. bilob. grass,
Rubus sp. Desmodium
uniflorum, Spathoglottis
Nephro. + Lys. corn. dominant.
Rosa seems sterile but
has spread.

Climb scarp onto flat
with open low
lehus and brush
of lehus. Dodonaea,
Styrphelia, Pteridium,
Sallens, Gleichenia,
Vaccinium ret. Dubautia
Polyipot. pell. weeds

In grassy opening and
Osmothera, Galins. ^{leu}
Scattered, Lentaria ^{some}
come out at K.M.C.

Mar. 26 - Crater Rim Dr.

Left at Bird Park Jct.

Veg. a *Styphelia*-*Dodonaea* scrub with scattered small lehua, becoming rapidly sparser till more ground than scrub shows.

Observatory. Much steam coming up from all around pit, and from many places on caldera floor. Drippy weather probably makes much more steam.

Vegetation on this high ground both sparse and depressed. Ground of rounded low tumuli covered by ash. *Bulbosyntis* abundant in open ash. Down hill both scrub and trees become more dense.

Where road flattens out again view left shows very sparsely vegetated ash beds on lower level.

Then a bare watercourse. Then road is down on low level. Vegetation very sparse - scattered Lehua 1-3 m. tall, small *Styphelia* & *Dodonaea*. Thin *Bulbosyntis*, *Congya* and tufts of several

weedy grasses. The ash surface here is somewhat indurated into a crust. Where extreme almost no vegetation south of Kalemuanau.

But in a bowl shaped depression to left of road a dense mixture of shrubs-*Dodonaea*, *Styphelia* and weedy grasses, sedges, *Desmodium*, etc. on fine black sand.

Beyond here rolling land with very little vegetation - an ash desert. *Grapheium* sp. scattered with ~~a~~ *Congya* can.

and an occasional little tuft of *Hibantia*, *Slyphelia* etc. in places where low ash has accumulated on the indurated layer.

Cross a series of cracks which are the s.w. rift of Kilanea.

Then a ^{low} purnier field with notable noce! veg. *Desmodium uncinatum*

Piantago lane.

Sporobolus elong.

Setaria

Verbena bonariensis

Cyperus compressus
Oenothera stricta
Linaris canadensis
Cynodon dactylon
Hypochaeris rad.
Ridens pilosa

Or few clumps of
Burmea gigantea
 and *Dodonaea*
Pennisetum mappelli
 and a ~~scattered~~ of unknowns.
filene struthioides,
 surrounding area
 on this side of Halemaumau
 an almost complete
 desert of ash and pahoehoe

Halemaumau Overlook.

Up toward rim again
 more and more *Styphelia*
 and *Vaccinium*.

Boulders on flat top
 thrown out by explosive
 eruption in 1924

Upper flats have a sparse
 scrub, of *Dodonaea*, *Vaccinium*,
Dubautia, *Styphelia*, *lehua*
 growing up thru a deep
 layer of fine pumice lapilli 1959

Keanahoi crater -
 pumice field in bottom.

Low lehua forest beginning
 to recover from 1959 damage by

another
common
much larger
than any
ever in
see now

pumice a former *Deutzia* layer.

Gradually changes
 to dense young lehua
 forest with *Hedderia*
 understory at Kilaven
 Ihi Overlook Jet.

Mar. 27 - Tree mold road

The road winds
 through open lehua
 woodland, similar
 to that along the main
 road, up over a low
 lava bluff.

On top is *Styphelia*-*Vaccinium*
 scrub, open, with
 open trees ~~in~~ it, grassy.
 There is a considerable
 area of this, with, trees
 on it locally, but very
 scattered.

Around the loop at
 the end of the road are
 many young *Acacia*
 trees.

Here are a number of
 excellent tree molds, shells
 of ~~the~~ lava that have
 hardened around tree trunks
 during a flow, before the
 wood has burned out.

Here also an excellent opportunity
 to observe transition stages between
 juvenile box leaves with comp. blades and phyllodes.

34

1961 Hawaiian Is.

Mar. 26 - east of Kilauea
Military Camp, Hawaii
National Park
in low Metrosideros forest.

- 41758 *Astelia menziesiana* Benth.
common, terrestrial
2 59 grass *Deschampsia nubigena* Hbd. ssp.
rare
1 60 *Luzula campestris* Hawaiana
Benth.
rare
1 61 *Carex*
rare
1 62 *Setaria geniculata* (Lam.) Beauvois
occasional
1 63 *Vaccinium reticulatum*?
occasional
4 64 *Stenogyne*
local on broken rocks at base
of cliff
1 65 *Cenchrus echinatus* var. *hillebrandii*

Mar. 26 - near Volcano House,

Hawaii National Park

- 2 66 *Cyperus polystachyos* Rottb.
very common in grassy
meadows
1 67 *Heterocentron roseum*? *subtriplicinervium*
local in low weedy brush
3 68 *Selaginella brasiliensis* f. Br.
abundant in wet place at
foot of cliffs on sandalwood trail

1220 m.

Hawaii

35

fruit yellow.

dense tussock

bristles somewhat yellowish
leaves concave.

arching scrambling
plant, 2 m. long; flowers
bronze color. leaves concave.

1200 m.

(L + O) A. Br. & Barde'

flowers white.

prostrate, forming
a loose mat.

Mar. 26 - Sulphur Banks,
Hawaii National Park
in open depressed area

4/17/69 *Agrostis avenacea*
rare

70 ~~Cyperus~~ *Fimbristylis dichotoma*,
very common, the only vascular
plant in lowest part of
depression

Mar. 26 - Flats southeast
of Halemaumau in
Kilauea Caldera, Hawaii
National Park

1200m.

71 *Rumex giganteus* f. *giganteus*,
occasional in open
pumice bed

1100m.

72 *Dubautia ciliolata* (DC.) Kots.
occasional on pumice bed.

73 *Agrostis avenacea* Griseb.
rare on 1790 ~~ash~~ crusted
ash surface.

74 *Graptohaliuum sandwicense* var. *bilobatum* Deg. & Sheriff
locally common on bare ash surface

75 *Silene struthioloides* Gray
locally common on bare ash surfaces

76 very rare on ~~ash~~ pumice.

culms solitary or almost so,
prostrate, whole population
thus dwarfed.

clump 0.7 m. high; ~~mat~~
flowers light green; mature
fruiting calyx before
drying, ~~is~~ very pale green.
shrub 0.5 m. tall,
flowers yellow.

subshrub with thick
fleshy tap root.
prostrate

Mar. 27 - Crater rim from K.M.C. + turn rt. at rim through irregular scrub washes along rim. Note that the section of rim you are on is separated by a big crack on rt. Will eventually fall in crater. *Polypteron pellucidum* abundant. Similar sandy. in trees on rt. *Astelia* under trees. *Faddeania cyathiflora* very good tree. Note anthocyanus in young lvs.

Bulbostylis in trail.

Note slight re-vegetation on lava flows.

Scrub here is of *Hypolepis*, *Lobelia Dodonaei*, *Gleichenia*, *Vaccinium*, *Coprosma ericoides*, *Faddeania macraei* var.

After 10' m. or so across at first opportunity to main travelled ~~marked~~ trail. 10' m. away from rim.

Vegetation becomes a bit sparser more in cracks than on level ground.

Gaultheria shallon + *Rubula* may be seen near edges of cracks sheltered by bushes.

Open ground has lichen *Bulbostylis*, *Hypoxystis*, *Corylus canescens*.

Colony of *Polypteron pellucidum* scleranthoid in trail over 200 m. along lava talus on scrub. Phenomena.

Scrub becomes more luxuriant, trees larger for a short distance. *Bauhinia* rather common. Then on rt. a large bush of *Vaccinium gayi*, with conspicuous erect branches. Shortly after, the vegetation again becomes ~~open~~ lower and more open.

Another common in open places.

Vegetation becomes lower, more open, *Lobelia* fewer, until there is as much or more open ground than veg.

Occasional great boulders near trail were thrown out by steam blast in 1924.

Vegetation more and more sparse.

Then up a lava scarp - more small trees on top (just before this, *Trifolium pratense* - tiny colony in ash.)

No trees on top, sparse scrub with consp. elongate *Coprosma ericoides*.

Volcanic obs. Uwekahuna

Lookout with good view of caldera & Halemaumau. Circular faults, steam, etc.

~~From front~~

From high ground bet. Observatory and Kipuka

Mar. 27 - Kipuka Puaulu, ~~Hawaiian~~ 1111m
Hawaii National Park,

41777 Hibiscadelphus giffardianus Rob.
small planted tree in edge
of mesophytic forest

78 Hibiscus hualalaeensis
small planted tree in
opening in ~~the~~ mesophytic forest.

79 ^{fosteriana} Pisonia ^{Fosteriana} _{Scarpa}
common P. umbellifera (Fest.) Seem.

Mar. 27 - Crater Rim Trail
bet. Kilanea Military Camp
and Volcano Observatory
Hawaii National Park

4 80 Santalum ^{Ellipticum var.} paniculatum
common locally in mixed
scrub

2 81 Polypodium ^{procumbens L.} adiantoides
common in trail for a short
distance, not seen elsewhere.

2 82 Myrsinopsis fayana
single tree in mixed scrub.

Puaulu pt. on clear day
a very good view of the
Kipukas and mosaic
of vegetation on slopes of
Mauna Loa.

tree 4 m. tall, flowering
abundantly, ~~the~~ corolla
maroon, curved, not opening;
fruiting (fruits tardily dehiscent)
tree 4 m. tall, flowering
sparsely; corolla green,
bright yellow-green within,
curved, not opening.
small tree 5 m. tall.

1200m.

shrub 2 m. tall, leaves
dull, yellowish-green,
fruit immature.

1961

Air trip Hilo - Maui
 Mar. 28 - N. slopes relatively solid wet forest above plantations, then a belt of grassland. ~~and~~ To west this widens downward with lower forest a mixture of forest and grassland, ~~and~~ where it merges with Parker Ranch Pasture.

Above grass belt is a belt of scrub (and mamani forest?).

Above this the bare top of the mt.

Maui - Wet forest on steep slopes s. w. of Hana, some clearings at bottom. Forest in Kauape Gap, but grass below mouth of gap, forest on lower flow slopes or brush?

s. w. of Kauape gap very steep bare ~~soil~~ deeply eroded slope - upper third scrub, lower bare or grassy.

The

This deep erosion for about 1/3 or 1/4 way to Haleakala. Beyond this upper slope scrub-covered, lower flow slope bare, grassy.
 Very top of Haleakala bare red ash.

Grassy slope just below scrub in western part with scattered trees, becoming denser to west at Anaehi, westward also, the scrub belt becomes thicker and taller, perhaps some Lehua forest.

A road around into this - is this the Auwahine Rd? no?? Lower slopes & Isthmus kiawe forest, dense above, to open and sparse, almost savanna in lower flatter area. Savanna on flat part of Isthmus where not in cane.

Lower ridges of W. Maui, s. of Iao V. badly eroded. S. shoulder grassy in lower 2/4.

Trip around East Maui by car - start 10 a.m.

94.9 Airport. Kiawe etc. Cane fields to with Grevillea wind-break. Then cane without wind break to near Puhalani jet. with a few Eugenia cuminii & hekeve. Pineapples & pasture.

Puhalani jet. Eucalyptus planting, Pineapples & pasture, to Upper Kula Rd. Jacaranda, Aracaria, Casuarina in small numbers. Cypress also.

Considerable Eucalyptus plantation. Grevillea and Jacaranda.

Pasture with some Opuntia. Ipomoea indica on fences.

Acacia dealbata abundant at higher levels.

10.6 Haleakala Hwy. jct. Upper Kula Rd.

Pasture with small farms, gardens - temp. zone flowers and vegetables.

Eucalyptus & *Acacia dealbata* plantings and thickets.

Foeniculum vulgare very common along rd. *Cupressus macrocarpa* planted.

Walker Rd. to Polipoli Hrs.

Acacia dealbata ~~is~~ forest below road, farms above, then farms below. Higher slopes pasture.

Now Santana, mostly leafless, on lava flows.

Kula Sanatorium at Keokeo Then pasture largely invaded and dominated by Santana, locally much Opuntia.

(Pond on Isthmus visible at head of bay).

18.3 views of Kahoolawe ahead and farai to rt.

Ipomoea indica along rd. *Abrus* nolle. Much Opuntia

and Santana.

Views of Molokini & Kahool-

Paspalum sp. with trifoliate lvs., white fls. Large stipules, green fruit turning yellow. common on walls and bushes. Kalanchoe abundant.

Melia tree scattered in pasture.

213 jct. Makaha Rd.

Kahoolawe - red top.

Eucalyptos planting.

Ulapalakua Ranch.

Old mill smoke ~~s~~ chimneys. jct. with Kanai Rd.

Bocconia frutescens on left.

Cinder cone with guava scrub, cut in black sand, on left.

Lava beds and cinder cone below or sit along road. Koaui below road on rt.

Open Santana scrub on weathered aa flow. with Kalanchoe.

Scattered *Reynoldsia* trees. *Nicotiana glauca* on aa. *Dodonaea*.

Hurkomania mix. very common. Some fence posts.

Bare cinder cone on rt. Pine

- Open Santana scrub.
Nic. glauca common along rd.
Weathered aa.
Black lava below along
coast.
27.2 aa with ^{spars} Dodonea, some
Opuntia, very bare lower
down.
27.0-3 scraps of dry forest
with Diospyros, Reynoldsia,
Myoporum, Caanthium,
Nothocestrum, Argemone,
Erythrina, Spornes tuboides,
I. indica, Zinnia elegans (naturalized),
Mirabilis, Nicandra,
Hunnemannia, Foeniculum,
Bidens pilosa, Opuntia, Sonchus,
Amaranthus spm., Nicotiana,
Santana, Tridax, filene gallica,
Leucanea, Cyndodon, Passiflora sp.,
Nothocestrum latifolium,
(or left by rd.), Chenop. valdeana,
then pasture with Leucanea,
Santana, Nicotiana, Opuntia,
with a few Erythrina.
Foucrea below on ~~left~~ rt.
Opuntia very abundant on left.
one Prosopis tree. Much Santana.
3 condacomes on left. well
29.9 Santana scrub and some grass.
some on rt. below.
Patches of Erythrina below.
Another condacome on left
patch of Reynoldsia + Erythrina.

- just below rd. on rt.
then open Santana scrub with
scattered Erythrina and
Myoporum. Caanthium.
Occ. Diospyros + Leucas
and ~~Hed~~ Aleurites.
Argemone.
Patchy of scrubby Leucas, ~~Nicotiana~~,
Erythrina, Diospyros, etc.
mostly Santana.
Xanthium, Abutilon mollle,
Nicotiana, Holanusa
socorroense, along rd.
Santana above, grass below.
Very rocky. Soil poor.
Occ. Erythrina, much
Opuntia - grass with
Santana.
Verbena common.
Have been descending for
some time.
Very rocky, little Santana,
rather little grass.
Occ. Dodonea + Caanthium.
much Opuntia. some Leucanea.
more grass, less Opuntia.
Argemone common.
locally much rd
Erythrina is scarce.
This aa probably est.
by erosion.
Grass, less ~~moss~~, rocks on

- Kauai, gentler slopes, just
above ocean. Manawainui q.
dry gorge. *Euphorbia* sp.
deposited, shingly, on walls.
low grassy slope. some *Ziz.*
36.6 another, smaller gorg & Kahelaimahani q.
with abundant *Euphorbia*,
Atriplex, *Lida*. *Hibiscus*. Tumstone
37.7 Another. prob. better stop.
few here - grass, over.
leiaue, esp. in ravines.
12. noon. Pebble beaches.
gorge with flat rocky bottom.
This *Prosopis* savanna.
38.2 *Prosopis* thickets on st.
savanna.
Kauai - bay with old landing.
Prosopis thickets. *Oximum*
sav.
Prosopis, *Leucaena* scrub
with *Opuntia* and a ~~few~~ many
Syphium
41.0 grassy slopes.
much *Opuntia*. *Zizaniacornuta*.
41.6 *Leucaena* scrub on st. st.
been on both sides.
42.1 Guinea grass pasture + *Leucaena*,
Leucaena
42.6 first farm
mouth of Kauai Pali.
Eugenia cuneata.
Church. st. *Thevetia* thickets on top.
Pandanus or M. ft.
Much *Leucaena*, some *Leucaena*

44.4

44.8

41.

- over. Kauai. Kauai area.
Farms. *Leucaena*.
Kauai School.
Gorge with waterfalls on
left. View of Kauai
patches on mt.
Erythrina scrub on steep
stream with *Eugenia*,
Pandanus, etc. Then a
st. *Thevetia* thicket.
Then low *Psidium* coll.
Eugenia & *Leucaena* forest.
Kauai in ravine.
spectacular rocky coast.
Windswept *Leucaena*
Euphorbia scrub.
Hau - mango forest. Kauai
bananas in gulch.
Euphorbia & *Osteomeles*
on cliffs on left.
Hau - guava.
Mango, guava, *Pandanus* coll.
on steep slope. see bluffs.
Mango forest with
Pandanus.
Fourcraea with *Eugenia*
cuneata.
cliffs.
Wet valley with *Leucaena*
mango, hau. Water falls.
not *Psidium* coll. *Cocoz*
breadfruit.
In grade up from this
Canavalia micropoda on st.

in han - guava thickets.
Stachys apalta microfolia
abundant.

Pastures.

Grass & *Psidium* esp. mango
thickets. Rubber in ravines.
Pastures.

more thickets. *Meliodia* red
alternans.

Tuff cliffs, bare.

Gulch with scrub of
Euphorbia & *Scaevola* on
s. side. *Pandanus* & *Scaevola*
on n. bluffs. Grass scrub
in bottom.

Cliffs - some *Scaevola*,
sporadically bare tuff cliffs.

Wattle beach. *Canna* in
bottom of gulch. Scrub of
Cantana, *Euphorbia*, *Banthus*
on sides.

Sea cliffs with *Euphorbia*,
Scaevola, *Pandanus*.

Gulch with han. thickets.

Fernanaria by small bridge,
Cliffs. *Pandanus* above.
Forcraea.

Wooded gulch with Mango
flwr. *Apronias*, *Ceiba*,
Thangs, Coco, etc. *Eugenia*
curviflora around from.

Pastures

Guava, mango, *Eugenia*
forest. Mixed Pastures with

thickets; mango trees
dominate landscape.

Guava, mango, Pandanus,
breadfruit, bananas,
Coco.

Mango and *Passiflora* +
pasture, some han. mixture
to Pipahula well old
mill ruins. *Terminalia*
grow on st. Village
with *Aracaria* and
many ornamentals.

Another *Terminalia* grove.

Grassy pasture slope,
on left, very green. Thickets
on rt. and in ravines.

Terminalia and *Eugenia*
trees along road. Hills on left.

52.2 Seven Pools. - beautiful
cascade in gorge.

Canavalia micropoda at
end of bridge. *Pandanus*
below - otherwise no native
plants. *Hesperis*, *Eugenia*,
Terminalia, guava, Coco,
Cantana, *Plumeria* (*in canary*).

Pasture

Gulch with *Pandanus*, *Eug.*,
kukui. Valley all.

Pasture + thickets.

Gulch with fan palms
bamboo, kukui, mango,
Eugenia, ti, *Zizotes*

Gulch with Eugenia - mango forest.

Guava - bread - Eugenia - mango thickets on bluffs.
Pemertonia pub.

Hormoea indica

General ~~waterfall~~ nature
of the same thickets
and pastures on bluffs
and in small ravines
to "Waialua" Gulch, where
there is a beautiful
waterfall on a grove
of Kubuhi and breadfruit.
Alocasia macrorhiza (ape),
~~as~~ torch ginger, red ti
in Commelinace slopes
below falls. *Thelypteris*
parasitica. *Selaginostachys*
clump to rt. of falls.

Hormoea indica festooning
cliffs. *Colorasig.* *Dioscorea*
bulbifera rare.

On wet rocks alga, much
Selaginella menziesii, ~~a~~ *Adiantum*
Pilea peploides, a bit of *Adiantum*
sp. and on drier rocks, *Polyph. thunbergii*.

By road *Zehnera pendula*,
Oxalis martiana, *Panicum*
orizosum, *Euphorbia glomerata*
Canavalia ~~tree~~ *microcarpa*
on tree. *Drymaria cordata*

54.9
Waialua
falls

By bananas between 2 bridges.
Breadfruit abundant.

Bridge over second stream
labelled Waialua.

houses and many kinds
of planted trees - Koali
Village.

55.5

mango trees. pasture.
Farm with Maladomia
planting on left.

Mico trees a little beyond
it. Coconut trees in
pastures and thickets.

Small farms and dwellings.
many *Pennisetia*, *Citrocalyx*,
mango, *Cocos Pandanus*,
Papaya, *Samanea* (desiolated)
Calophyllum, etc.

Scattered scrub on
sea bluffs.

Farms & pasture.
Wide level pastures.

59.9 Hamoa Beach Rd.

Pasture invaded by guava
on level ground. thickets
and pasture on bare slopes.
Kubuhi in pasture on rt.
have also - round clumps.

Wooded area cone on
rt - Metaleuca.

Casuarina planted
just above beach ~~just~~ *pebble* beach.

Kubin along ravine to rt.
Guava thickets on rt.
Pasture & stock pens.
Row of ~~the~~ *Araucaria* and
Caviahua leading into Hana.
Andes cone on point
wooded with *Casuarina*

62.7 Hana - 2 p.m.
Crinum procerum - fine
row on rt. by hotel.
Beautiful Hana Bay.
Lighthouse on point.

Old Casciarino trees.
Pastures & rt. House
and trees, wet lowland
forest to rt. Tall *Araucaria*.
Breadfruit very common. *Banana*,
Pandanus, *Eugenia*, *Terminalia*,
guava, mango, *Hibiscus*
Carica, *Persea*, etc.
Pastures & thickets.

63.6 *Pandanus* forest on rt.
Extensive pasture, guava
brush on slopes above rt.
Road is well up on slope
good patch of *Pandanus*
forest down on coastal flat to rt.
Wooded ravine in pasture.
Bamboo trees planted along
road.
Kubin with *Eugenia*
malaccensis, guava, etc.
Guava - *Eugenia* road.
Hibiscus thickets.

69.7 Large canyon.
This several large
Eucalyptus robusta.

Guava forest below,
pasture, much invaded
by guava, above.

Pasture, with a few
Manihot glaziovii
Eugenia jambosa
graves in pasture.
Heterocentron roseum along
road.

71.8 Pasture gives way to thickets
and forest, *Gleichenia*.
much land has been cleared
for pasture, but overgrown
largely by guava, *Gleichenia*,
etc.

72.5 Some lava, bog, many
planted trees, mostly
guava thicket.

Pastures more and more
overgrown. *Gleichenia* and
guava most abundant
some farms and pastures
on slopes.

Koa more and more
abundant, some lava.
Many planted trees
Melaleuca, *Eucalyptus*
Pua Kaa Park.

Koa very common as forest
ridge before Waiokeani falls.
Schinus very abundant
above ~~Waiokeani~~ Waikiki Taro
patch. Much has and
Ipala forest on flats sea-
ward of taro. Has on slopes,
also.

825-8 Beautiful over along coast
line, then another up Waiauia

845 Beautiful view of Honomono
Gulch with side ravines
full of hubini.

865 Kauaihina Park
planted Eucalyptos and
Acacia constricta, Melaleuca
leucostachys.
Many aroids, ginger,
Impatiens sultana
collection of Cordyline lém. var.
Beautiful view of Keanae
Pen. from lookout.

Xanthosoma sp.
Dieffenbachia picta
Feindapnis aeneus
Philodendron lacuna
Heliconia humilis
torch ginger
Costus sp.
Cibotium chrys. or glaucum

- 87.8 Bet. Hainapuna Pohuahawas
gulches - Eugenia malaccensis
trees along ~~rd.~~ rd. on rt.
from July & Aug.
Gulches before Peahi
have Pandanus, hubini forest.
Prosopis forest along beach
near Spreckelsville. Cane
plantation to left of rd.
Punene jet. 4:20 p.m.
Road in cane fields lined
with Brathidea
Cane to Punene Mill
jet. on main st. in town,
Giant Cyrtolobium to rt.,
Samanea to left. Cross this.
More cane for a long way.
Cane on left savanna on
rt., then on both sides.
20.9 Cane on rt. Prosopis forest
or left - thick, to 8-10 m. tall.
rather open ^{low} Prosopis forest
on both sides; then very
dense. 10 m. tall.
Sea. ~~to~~ turn rt.
Prosopis forest on rt.
houses along beach.
23.3 Flats of Batis maritima
along road, bet. road and
pond. Atriplex semibaccata
& A. sp. also Sesuvium
and bare salty areas.
On other side a strip of Batis.

then *Prosopis* forest.

Bet road and beach a sand strip of ^{soil} a triple ^{moderately}
Chenopodiaceae, halopepli detox pet.
Acacia, and
on beach ridge *Ihorobulus*,
virginicus & *lescurii*.
Sporodesma *per capras*.

24.8

outlet.

25.8

end of *Batis* flats. beginning
of cane fields.

26.8

slopes of West Maui on left
lower slopes and bluffs grassy.
Jct. Salapino Rd. ^{Tauwai} Keawe & Leucaena
on rt. Then cane field.

Gulches on left brushy,
ridge grassy a eroded into
dark red dirt.

Most of alluvial fans wooded
until just before Waikapau,
where a large fan is being put
under cultivation. From here
on all are in cane.

27.9

Banana trees along road on left.
from Waikapau to Wailehu.

Wailehu. 5 p.m.

Royal Palm on left, on street entering.
(High St.)

Kanaha Pond Wild life Sanctuary
Maui Traffic and Planning Commission
has plans to develop this, with
picnic areas, etc. (County govt.)
Robert Ohata OHATA.

Joe Medeiros is Chairman
of Commission.

Plan A provide extensive
green areas on land, some
of it to be filled, in center
of pond. Parking areas
on all side. Magazine
areas to be retained in pond.

N.C. or Audubon Soc. should
look into this.

Flight Maui to Molokai -
Lower slopes of W. side W. Maui
are in sugar, that is, the low
slopes bet. the gulches.

Molokai - s. coast -
considerable acre development.
but with gaps at mouth of
streams. Lower half of
slopes, including all the
low-slopes are in pasture, except
Keawe forest on lowest part.
Upper ridges and slope footed
and stony bottom in upper gulleys
but some of the western
ridges are terribly eroded
up to not far from tops.
and farther up the
grass goes almost to tops.
lower slope and ravines
in open *Prosopis* forest or
savanna (abundant).

Green grassy area in back
mangrove swampland

be Bates. A few bare areas in them.

Some red silted areas also. Dry scrubby vegetation, probably Prosopis grass, and ^{old} eroded areas. Grassy slopes being actively gullied.

Mormoni sand strip seems to be almost all wooded now.

Lavanna and Briar forest on west end. Also a depression back of main western beach that may be a marsh surrounded by briar forest.

62

1961 Hawaiian Is.

March 23 - Kealia Pond,
south side of Isthmus

- 41783 Atriplex
abundant on sand back of beach
- 34 Atriplex
common in edges of saline
flats around pond, in sand
auwahi, n. of Naabailua Hills.
- Mar. 28 - south side of
Maui, ~~s. E. of Hana~~ ~~Hanapepe~~ ^{485 m.}
on dry aa lava slopes
- 85 Ipomoea tuboides n. var.
common
- 36 Diospyros ferrea var. pubescens Fock.
~~occasional~~ occasional in remnant
of dry forest
- Mar. 28 - ~~s. E. of Hana~~ Kabaleiaimahana gulch, Mauawainui,
side of Maui ^{60 m.}
- 87 Euphorbia
common on cliffs of small
gorge
- Mar. 28 - Wailua Falls,
2 mi. s. e. of Hana ^{50 m.}
- 88 Artocarpus altilis (Park.) Fock.
very common in gulches
along road.
- 2 89 (alga) ~~Alaria~~ ^{Alaria} sp., ~~Leptophora~~ sp., ^{1 m.} ^{1 m.} ^{1 m.}
abundant on rocks in falls ^{det. W. S. Gillett}

Maui

63

erect.

much branched evergreen.

flowers white.

small tree.

lactiferous
prostrate shrub.~~fair~~ sized tree.

Apr. 3 - Los Angeles - Tucson
(Constellation, left side 5:30 p.m.)

El Segundo sand dunes
are completely covered by
oil refinery and houses.

Palos Verdes Hills - a low
density development, with
areas not occupied by
houses either in a golf
course or very well
manicured. A few scars
on hill tops that look
like sand diggings, and
a big quarry and a
nearby area graded in
horrible terrace square
presumably for building.

Santa Ana Mts. have
very considerable areas of
chaparral intact, also a
road up to a radar station on
a peak near the summit. Rocky areas.

Hills east of here dry bare,
little if any chaparral.

San Jacinto Peak with no
visible snow. Upper peaks
and ridges very rocky,
almost lack of vegetation.
West slope of summit peak
looks as though it had
dropped alpine vegetation.
Considerable forest in upper
valleys and canyons.

In valley by Palm Springs

and Indio what appears
to be a dry lake - cultivation
intermittent on either
side of it. Part of the
bare area apparently
laid out in house lots.

Is this salt or sea - if so, it
must be dry.

Morongo Valley still
untouched except for road

Little San Bernadinos
as dry and bare as I remember
them. Chocolate Mts. also,
though there seems to be
vegetation in the bottoms
of the canyons.

Several parallel roads
along L.A. aqueduct, across
rast series of bare fans,
coming out from a long
straight mountain
range front, undoubtedly
a dissected fault scarp.
Some sand along this, and
especially a large pile of
it near the eastern end
of the broad valley through
which the aqueduct runs.

Afri. - Tucson - Chicago (707 jet, left side). (Departed 10:15 a.m.)

Valley above Tucson - for some distance a series of complicated washes braided on the floor of a broad flat valley. Small check dams. Small ravine cut into desert floor.

Then a rather large wash with considerable vegetation immediately adjacent to main stream bed.

Upstream this forks into many small streams in a dendritic pattern. All this is fairly undisturbed desert.

At head the course passes over an imperceptible divide into another stream system. This river runs off to the left, with dense woody vegetation and a few green cultivated patches in bottom land - open desert otherwise. Mountains to left of this well wooded at higher altitudes.

Beyond here very sparse desert vegetation or not very rough land. Then a cultivated valley with a

small town and air strip - the cultivation all well above the town - apparently alkali flats below, with small reservoirs. Wooded mountains in distance to left.

Rosedale desert country below. scattered small trees on mountainous parts, sparse scrub on more level parts, more dense along watercourses.

Then another village with rather extensive cultivation. This valley leading northward with much cultivation in far distance.

Open desert country with buttes - very sparse scrub except slightly denser along ~~streams~~ water courses.

Then gray low mountains with extremely little vegetation, but this strikingly greater on north-east slopes than others.

Another, much narrower, cultivated valley - cultivation only on bottom-land.

An enormous strip runs in distance toward head of this valley.

Vegetation on slopes leading down to this valley very sparse.

Country gets rougher, leading up into a wooded plateau or gentle slope eastward from an abrupt scarp which falls off abruptly to west. Eastward this slopes off into gently dissected country that is grassy except in ravines which are sparsely wooded or brushy.

Generally mountainous but not too rough, locally wooded to north.

Then a very rough mountain mass, very high, with coniferous forest with traces of snow on northeast side of crest, on course - this extensive, extending n.e. in a high, gently dissected plateau, well wooded, with farther n.e., some areas of grass or very open or sparse forest, ~~a~~ high wooded peak with mountain meadows near top on north side.

Generally mountainous and wooded country in this whole area except on

extensive grasslands in distance to left.

Then large grassy patches closer by where terrain is flat.

A mosaic of wood and grass on an apparently high plateau. Snow locally. This for some distance with variations.

A conspicuous lava flow then, about 50 min. from Tucson, a great snow capped peak, isolated, on immediate left, Redondo Pk.

A snowy range in distance? A lava flow just east of it.

Then at just under one hour out, the Rio Grande Valley, and a great rugged range east of it. The bottom lands intensively cult. the slopes desert, very sparsely vegetated.

The Mt. range mostly wooded, with a sharp crest, snowy on east side. Extensive snowy mts. far to north.

Lower wooded mts. and large plains areas along course. Some large

scale cultivated areas.
Then mountains again
with pine forest and
many high very snowy
peaks extending to nulls
from a belt of lower
wooded mts. and hills
across course. This mostly
sparsely low wood - possibly
pinon-juniper, much
grass, esp. eastward
where it gradually fades
into desert grassland.
Some incised meandering
streams. Vernal pools?
Typical high plains.
mostly thin grass, thubby
areas locally near water
courses. Mosaic with
some forest to left. Snowy
mts. in distance.

Detail of vegetation pattern
in plains below very
interesting, with relation
to water courses, low erosion
remnants or mesas. Would
be worth examining on
ground.

Rather large reservoir on
immediate left.

Along river below this,
extending and meandering
eastward ~~or southeastward~~,
some very severe erosion.

exposing bright red
material. Course follows
this river. Vast grassland,
erosion wherever there
is any relief.

Then, very locally, some
cultivation, but here
away from river. No bottom
land cultivation - no
bottom lands. Cultivated
areas larger eastward,
grass between them
but rather sparse.
Scattered sand dunes
along the course of
river but a little way
on other side of it. River
becomes notably larger.
Water a red color, sand
bars pale tawny. Sand
dunes also tawny. No
more cultivation after ~~and~~
~~to~~ beginning of sand
dunes. After sand dunes
area vast plains locally
with many vernal pools
and small ponds the latter
formed by damming
small water courses.
Still some erosion, locally
serious.

Then ~~the~~ river augmented
by a large tributary from
northwest. Much cultivation

in distance to north. Gully erosion locally very conspicuous, especially south of river. River

~~Crossed to north side
of river, then~~

gets larger, gets closer to large cultivated area on north. Extensive plains on both sides of river. There have been no trees along this river nor along its tributaries.

Small city to south of river. Bleak! and what appears to be an oil field - east of it.

Course still parallels river. Tributaries are dry and very sandy. River bed wide and braided.

Terrific gully erosion in complicated dendritic patterns on both sides, especially the south side.

Vast cultivated area not far north of river.

Crossed river at 1:15⁰

Partly cultivated, eroded plains, more intensive cultivation to north. Becomes more spotty to northeastward. Much open thin grassland. Laid out in squares marked

by roads.

Then a red area, rather deeply gullied. Rather a lot of cultivation to north.

Many dammed up gullies forming small ponds.

1:58 crossed a broad braided river course at right angle. No conspicuous woody vegetation. Then more dendritic gully systems cut into red plains.

These gullies beginning to have woody vegetation in them, flat between them grassy, gully slopes bright red and bare.

Scattered cultivation.

Red area very large.

Gullies now generally wooded and ~~slopes~~ river bottom lands cultivated.

At about 1:20⁰ land becomes generally cultivated - some small grassland areas, but 80% of area under cultivation.

1:21⁰ Topeka and Kansas R.

Chicago-Baltimore - (left rd 22-8)

3:39. North over lake, then east.

Crossed shore where it turns north. A few areas of wooded dunes - 3 ponds at north end, some

sand excavation at south end, highway passes on land side.

Country to east intensively cultivated, but many small lakes and woodsy meandering stream courses. Not very green at this season.

A very few small wood lots. South west part of Lake Erie has a ~~near~~ small archipelago of islands of varied sizes, mostly largely cultivated.

Locally in n. e. Ohio an appearance (from 2700') of some snow remaining in elongate patches, as against fences, etc.

Just before landing crossed what may be a small serpentine barren, open gray land with a few small pines. On left of a paved road going northeast toward Baltimore.

Not a large area. Possibly only an abandoned pasture.

April 12 - mall side of Capitol Bldg. - magnolia grandiflora on the two sides of the capitol steps have become a bird rookery since the capitol has been wired to drive the starlings and pigeons off the building. The result is a layer an inch or more thick, on the ground and on the branches, of guano.

The magnolias, as well as *Flex. opaca* and *Ligustrum* ~~and~~ (*Calif. privet*), have become largely defoliated and seem to be in very poor condition.

The remaining magnolia leaves are browned in spots where splashed with guano. Even the small twigs have an accumulation of guano. Not a plant of any sort is growing on the ground under the trees, however, even before the invasion of birds nothing much was growing there. Now, of course, there is almost no shade to have an effect.

1941 Virginia

April 16 - Balls Bluff
 flowers in bloom in
 deciduous woods on slope
Saxifraga virginica
Hedysotis caerulea
Antennaria plantaginifolia
Claytonia virginiana
Amblychanthes arborea (Michx.) Teng.
Dentaria laciniata
Dicentra cucullaria (L.) Bernh.
Dicentra canadensis (Goldie) Steyermark
Viola papilionacea? glabrous yellow
Erigeron bulbosa (Michx.) Nutt.
Jeffersonia diphylla (not flowered)
Caulophyllum thalictroides
Hydrophyllum virginianum (not fl.)
Languinaria canadensis (part)
Trillium sessile
~~*Phlox diffusa*~~
Podophyllum peltatum (buds)
Erythronium americanum
Mertensia virginiana
Viola canina
Asimina triloba (buds)
Acer saccharinum (young fruit)
Lindera benzoin
Smilacina racemosa (not fl.)
~~*Potentilla*~~ Glechoma hederacea
Corydalis flavula (Raf.) DC.
Stellaria media
Alliaria officinalis (buds)
~~*Stachys*~~ *Lamium purpureum*
Erythronium albidum
Thalictrum thalictroides

Dodecatheon meadia L.
Luzula campestris v. *multiplex*
Sedum ternatum (not fl.)
Carex sp.
Carex sp.
Aralia canadensis (buds)
Arabis laevigata (buds)
Asplenium trichomanes
Asplenium rhizophyllum
Asplenium platyneuron
Cystopteris fragilis
Polystichum acrostichoides
Barbara vulgaris (buds)
Henckelia sp.
Dianthus spicata (not fl.)
Stellaria pubescens
Ranunculus abortivus
Viola striata
Galium aparine (not fl.)
Lonicera japonica (not fl.)
Veronica hederifolia
Poa sp. *cuspis*?

April 23 - Great Falls, Va.
Phlox subulata in
 full bloom on rocks
 below falls - mostly white,
 a few pale purplish.
Saxifraga virginica
Ranunculus abortivus

78

1961 Virginia

~~Spur~~
April 16 - Balls Bluff,
Potomac River east of Leesburg
in Deciduous woods on
river bluffs

4/17/90 *Viola cucullata* Ait.
occasional

1 91 *Viola pectoralis* Pursh ?
common

1 92 *Veronica hederaefolia* L.
abundant

1 93 *Lamium purpureum* L.
common locally

1 94 *Poa cuspidata* Nutt. ?
common

Loudoun Co.

79

flowers rich violet,
center dark.

flowers light violet.

prostrate; corollas bluish,
falling very easily.
erect bracted leaves
dark purple, corolla
rose pink.
small loose tufts.

May 15 - Utrecht -

Lawns with abundant
Bellis perennis.

Pastures with abundant
Ranunculus acris.

Crataegus flowering.
Sorbus just past.

Curious form of *Hedysarum*
caeruleum in Prof. Mennekes' garden. (said also to be in Edinburgh Bot. Gard.) Is same as seen in Baarn in 1948. Certainly closer to *H. micranthum*.

May 20. rail from Leiden to Utrecht.

Polder landscape - rich green grass, cropped rather short. Land cut by ditches into long rectangular checks.

Ditches have some marsh plants - *Iris pseudacorus*, rare clumps of *Salix*. Water surface partly covered by *Lemnaceae* and floating felt of green algae. Small carefully tended gardens near rr. tracks. Soil almost black.

A few weeds, e.g. *Barbarea*, *Brassica*, etc. but not many. Sheep and cattle in moderate numbers.

Toward Utrecht rows of pollarded willows and poplars become common and dominate the distant landscape.

white umbellifer

Small orchard near Woerden, but country is dominantly meadow. Some hay being dried, but not much.

A little *Phragmites communis* along ditches along rr.

Rather large orchard of apparently dwarf trees recently planted. Meadows have more *Ranunculus* and other conspicuous flowering plants. More orchards. Small patches of *Alnus*-*Salix*-*Populus* wood. Rows of pollarded trees and orchards more abundant toward Vleuten.

Gardens, cold frame and commercial greenhouse common just beyond Vleuten.

Ground has gradually become somewhat higher toward Utrecht.

May 15 - Utrecht - Arnhem - to Germany. In Utrecht 9:20 a.m.

Landscape much more dominated by trees. Meadows with flowers separated by rows of trees, *Crataegus* hedges, patches of wood. Beech, pines, oaks are prominent also *Betula*. Thickets. Open pine forest with deciduous

under story. Some Pinus. Much young forest - planted? Pine is the most prominent larger tree. Young pine is notable, but many other young trees - *Populus tremuloides*, Robinia? Stands of pine generally have a broadleaf under story, but this is inversely prominent according to thickness of pine stand.

Thickets along tracks in place obscure view.

Cytisus scoparius is locally common on n. embankment also *Calluna*. Mostly grass or planted rye. Mixed agriculture, mostly draining. First low hill or knoll.

But this is isolated in generally flat country. Soil becomes gray rather than black, but this varies locally to yellowish or brownish.

9:44 Enke-Wageningen.

More low hills. Cuts with heather. Country becomes gently rolling. Patches of rather young pine forest (*P. sylvestris*). Heather along tracks in rather broad strip. Some *Cytisus*. Scattered young oaks, birches, *Populus*. Thickets and patches of small oak.

The heather quite local. Oaks and other broadleaf trees dominate landscape generally.

Hills slightly higher near Arnhem. Robinia abundant with oak.

Left Arnhem 10:17.

Flat country, but hills in middle distance left and in far distance ahead. *Salix alba*, mostly pollarded, common. Meadows with abundant *Ranunculus*.

Some thickets and patches of pine forest. *Cytisus* locally common along tracks, flowering.

Mixed hedge common, esp. along n. *Crataegus* and various other shrubs and small trees.

Small orchards. Mainly grain fields, meadows, patches along tracks and roads with row water or mud, marsh plants, shrubs, *Salix*, etc.

Low flat wet land, mostly meadow.

Very slightly higher, slightly rolling, mainly grain fields. Rows of trees, small orchards.

Just beyond Mierloog some

10:32

10:47

10:52

fairly large patches of pine woods.
some larch, birch, oak.

10:59 some small swampy spots. still
large pine woods. Several genera-
tions of plantings. Considerable birch,
Robinia. Rolling land.

11:04 Weel. Much industry in all direction.
generally pasture with some
thickets and woods. *Cytisus* locally
abundant in waste spots and
along r. *Rumex acetosella* C. also.
Woerde - grain fields, pasture,
some orchards and woodlots, mostly
oak, *Tilia*, etc. no pine.

near Dinslaken the soil has
a thin dark layer. Below this orange.
Heavy industrial area. much smoke,
from here to Oberhausen.

Oberhausen is a huge horrible
industrial expanse.

Arr. 11:23 Oberhausen Hbf. Lv. 11:37

Low hills in distance to left.

Duisburg Hbf 11:42. Lv. 11:45

Smoky industrial area
continuous. Some patches of pine wood.
Then grain fields. largely
rye and pastures. Rows of
Salix along ditches. Some hedges,
Crataegus, *Lambinus*. Woodlots -
mixed.

Dusseldorf-Unterath -

Dusseldorf is another big horrible
industrial place, but perhaps
not so bad as Oberhausen.

Dusseldorf Hbf - arr. ~~12:00~~^{12:00} l. 12:05

Nice park(s) with many
trees, ponds, etc. just out of
city in rt. Then smoky
industrial area.

12:13 Wide area of grain fields
in absolutely flat land.
A few rows of trees. Apparent
woods in distance on both sides.
Trees and hedges principally
around houses and village.
Langenfeld

12:15 12:19 another frightful industrial
area - smoke and fume
limiting vision and almost
as choking as in Cuenca Pasco.
Nice gardens back of houses.
Large strip of wood on left.
Grain and potato fields.

12:23 Dln - Mülheim - more industry.
Sambucus seems to be the
dominant weed-tree in
waste spots, on embankments, etc.
Platanus common street tree.

12:29 *Robinia* abundant, flowering.
crossed Rhine. Cologne station - dep. 12:52

Flat intensively cult. bottom
land. Low bluffs in distance
to rt. Vegetable, potato, fruit trees.

Bonn

Route at foot of bluffs
starts to climb. Rhine
immediately on left.

10:17

11:18

Then for some distance
the m. is along the river banks.
The bluffs are heavily
covered by houses.

1:30 Flood plain has broadened
considerably and the bluffs
are much less abrupt.

1:35 track again ^{slightly} squeezed bt.
river and bluffs. Bluffs
covered by dense mixed
oak (?) forest, rather low
and bushy but canopy
practically full.
Occasional grassy spots
invaded by bushes. Orchard
in flood plain.

1:49 plain wide, bluffs low,
mostly cleared.

1:51 plain very much wider.

1:54 Koblenz. Commonest wood tree
again bambusa nigra. Crossed Moselle
interesting castle to rt. of
station.

2:03 The Rhine, thus far, seems to
carry a great amount of barge traffic
left Koblenz. Bluffs on rt. imposing.
Robinia is a common tree.

Raining rather hard.

2:09 crossed Rhine. wide here.

2:13 above Niederkahn -

High hills across on rt. a castle
on hill to left.

Then high hills to left, wooded
near tops. Flood plain intensively

gardened - mostly potatoes,
between fruit trees.

Gardens on rather steep slope
on left.

2:18 m. squeezed bt. river and
hills.

2:19 Hills on both sides partly
wooded, partly grassy,
locally cultivated.

2:21 Some terracing and walling
in other side, steeper slopes
cult. Osterpaj

Most of other side, though
very ~~steep~~ ^{steep}, base of
wood, cultivated.

Valley here is very narrow.
scarcely a flood plain.

Sides now steep,
semi-wooded. This is the
Rhine Valley as I had expected.

Visibility since Koblenz has
been ~~bad~~ very bad because
of rain.

2:28 Hills or bluffs partly densely
wooded, partly open and
semi-terraced.

All this part is very narrow.
m. even tunneled in places.

Some vineyards - small,
on narrow benches of gravel
or broken rock bet. m. & river.

2:35 Spectacular steep semi-
terraced slopes. Castle.
several photos.

- 2:43 Wooded bluffs again.
near Kaub?
Castle on island. photo. (bad)
- 2:46 Spectacular churches and
towers across river.
Lorchhausen?
- Photo of castle across from
Loch.
- Along here the towns are
long and narrow, at foot
of bluffs along river.
Vineyards on lower slopes.
Steeper slopes wooded.
Low wooded islands in river.
Fine ruined castle across river.
- Another, above a broad bar
in river where many
people are camping.
Vineyards on terraces and
semi-terraces on left side.
Vines staked up on wires.
Wires running up and down slope.
- Assmanshausen
Steep wooded bluffs on
w. side.
Bingen across river. photo.
Tourist tower on small island (photo?)
- 3:00 Rudesheim. Picturesque r. station.
Vineyards on e. bank slopes,
and on lower w. bank slopes,
dense woods above. Spectacular
church on top of bluff on w. rd.
Turned east along Rhine.

- 3:12
- 3:14 Extensive vineyard
on gentle slopes
large islands in river.
Mixture of fields, orchards,
villages.
- 3:20
- 3:26
- 3:55
- 4:07
- 4:20
- 4:25
- 4:28
- valley here much wider,
more agricultural and
less spectacular.
River is wide. Channel
marked by levees, but
water outside levees
as well as inside.
Main Valley is broad
and rather flat. Vineyards,
orchards, pastures, grain
fields.
- Hattersheim Main.
Much interplanting
in all these orchards.
Strawberries abundant.
Sambucus abundant along
r.
- Frankfurt am Main Hbf.
Left Frankfurt. Crossed Main.
Beautiful rows of Lombardy
poplars.
- Frankfurt (Main) Sud.
Intensive truck gardening in
orchards on bottom land.
- Patches of open oak woods

- 4:29 Affenbach. *Abies sylvestris*
fairly large pine forest on rt.
4:33 more patches of pine
4:35 Steinheim (Main) crossed Main
again.
4:46 Patches of pine and spruce.
at least 2 terrace levels
along Main here.
4:50 Hills in distance on both sides
and ahead. Thickets and
trees prominent in landscape.
4:53 Aschaffenburg
Hills with planted *Picea*
forests, some pine-spruce.
lower slopes and flat on
rolling valley land cultivated.
Forests on hills as mixed
broadleaf as conifer.
5:07 Hedges of *Crataegus*, but few.
5:04 Hösbach
Hills become higher and a
bit more rugged in distance
on both sides. wooded, very
neatly.
 Woods of *Picea*, *Lilis*, *Quercus*,
Fagus, *Prunus larium?*, with
very thin undergrowth except
at edges.
stop in woods. grain fields on lower
slopes.
Laufach dep. 5:13
Beautiful valley, lower slope
cultivated, upper parts
of hills wooded. Grain fields,

5:16

5:23

5:28

5:30

5:40

5:49

5:52

5:55

6:08

- meadows and orchards.
rt. is in low mt. now,
partly wooded
mostly mixed woods.
long tunnel.
Pin forests with an irregular
~~irregular~~ scattering
of beech etc. Some of
it has a definite
second layer.
beautiful solid beech forest
and ~~the~~ patches of pure conifer.
Country wooded except flat
valley bottoms and patches
of slopes which are pastured or
cultivated.
Valley now very much wide. Main R.
Gernsunder.
Above, the valley narrow
again - wooded sides, flat
bottom with meadows, along
Main.
Broadens out again.
Cultivated.
steeper slopes bushy or wooded.
Karlstadt (Main).
Above this rather wide flat
valley plain, medium hills.
partly wooded on sides.
A few trees along river.
Wurzburg left 6:17
Marienburg Castle on hill off.
Rolling hills covered by grain
fields, some thickets. bamboo.

6:22

Hills with open oak forest and thick understory of shrubs on it.

Generally grain fields.

6:35

Uncommon mixed forest on right.
The patches of scrub in the grain fields, & the hedges seem mainly *Prunus* sp. with some other shrubs.

6:37

Extensive rolling plateau.
Generally cultivated, mostly grain. A very few small orchards one or two woodlots, scarcely any hedges. Mostly vast open spaces, especially to left. Some scarp with scrub and scattered oaks.

6:41

Broad low valley to left has large areas of pine forest.

6:43

Kitzingen.

6:45

Pine woods with some admixture of broadleaf trees, understory of *Rubus*, etc.

Then open fields. Then an oak forest, rather good.

Then pine + oak patches.

6:46

Rolling open country. Some patches of wood.

6:48

Some rather abrupt hills on left.
Rolling open country with small trees along roads, etc. on rt., extensive.
Mostly grain fields.

6:51

This continues a long way but finally wooded con-

ridges in distance on each side.

6:58

Ridges have come fairly close. Some fairly long areas of rather low dense forest. Some patches of pine.
Then more broad open valley with wooded low ridges in distance.

7:00

extensive patches of pine forest.
Rolling land. Dark chestnut red soil.

7:02

more pine, considerable areas.
slight admixture of beech,
cherry, birch, etc. Pine, juniper.
Generally open grain fields
but large patches of forest.
Crosskirchen

7:08

Patches of pine, spruce, some oak.
Calluna in cuts. Mostly open grain fields on rolling land.

7:12

perhaps as much pine as grain field.
considerably more pine than grain, open fields only in bottoms of shallow valleys.
Some oak, birch, beech mixed with pine, also some spruce.

7:14

Flat open valley quite wide,
open on low hills on both sides.
This for considerable distance.

7:20

Foothills ~~7:25~~ Nürnberg.

7:25

Left Nürnberg.

7:45

Valley mostly thickly settled

near Nürnberg, trees common.
There a patchwork of pine
forest and grain fields. villages,
Cytisus abundant on cuts, in
flower.

Then the narrow flat valley
bottom is open, the gently
sloping sides wooded, mostly pine.

The pines in these planted
pine forests are very closely
spaced, even after the trees
have reached full height,
are very well self pruned.
but not large in diameter.

Beyond Möhlstetten there is
some heather, but only very
locally in openings in pine woods,
mixed with *Cytisus scoparius*.
still mostly pine forest,
but a mosaic with fields of
grain.

8:19 8:20 Open rolling country, only a
few patches of forest.
Open rolling country, only a
few patches of forest.

May 21 - From Munich south
in valley of Isar R. by auto
plain south of Munich is of
Tertiary gravels, terraces,
terminal moraines.

Planted *Picea* forest with
natural reproduction of
beech.

Alpine species found here
minimally
only on peat bogs.

Munich
Bad Tölz
659 m
Kochel See
549 m
Waldenbuch
802 m

River line in north Alps.
1400-1700. Central Alps. 2400
(soil over 1900 m.)

Agriculture becomes
less to south, dairying
more - too wet to south
rainfall more than doubles.

Forest on edge of moraine
d *Acer pseudoplatanus*
Alnus curvata
Lambinus
Fagus *Picea* planted
Tilia

10-12 sp. trees
e *Lamium galeoplodon*
a *Agrostis*
Acium rufulum
Anthoxanthum
Pubus
Colechium autumnale
Gysanum
Paris
Urtica dioica
Ranunculus lanniganus
Listera ovata
Urtica membranacea
Hymenophyllum officinale
Pulmonaria
Impatiens noli-tangere
along Würm R. WVRM
in Würmthal below Starnbergsee
in flat bottom of
wide ravine cut in
moraine.

Low hilly land with beech forest, flat broad valley mostly in meadow below Starnberg. Some planted *Picea* in beech forest. Orig. forest 90% beech. (Huet)

Starnbergersee is in glacial valley, (much like Finger Lakes, N.Y.) but in lower country.)

Extensive meadows, with mouse-brown cattle rich flora of flowering herbs, on rolling land.

This morainal material is chalk and dolomite in nature. Much planted *Picea* forest. This is between Starnberg and Walpatschhausen. These moraines are of small gravel and sand.

Iser Valley Lorsach R.

On river deposits an open dwarf vegetation with much heather, *Pinus sylvestris* very open, *Juniperus communis*

Viburnum lantana

Erica carnea

holcus aris

Liatanthes

Globularia

about
Supplying
~ 2000 ft
~ Wolpatschhausen
~ 3000 ft
on Iser

along Iser

Bigustrum vulgaris

Daphne mezereum

Hedysarum conosum

Daphne cneorum (^{beautiful} rose pink fl.)

Calluna vulgaris

a *Thesium*

Carex pilulifera

Polygala chamaebuxus

Erophorbia

Psylla trilobata

Orobanchy

Aconitum vulgare

Nicotia tabacum-avis?

Polygala comosa

Bellidium strum michelianum

Gentiana acaulis

Globularia

Primula farinosa

Ophrys muscifera

Cypripedium calceolus

Listera

Peripheral area is open forest to 15 m. ^{2-3 dm.} with full

shrub layer of Juniper

ground layer of Erica + moss.

The large areas varying

from open forest to savannas.

Picea & mostly not more than 30 m. and dense grass and some heather.

Several *Carex* spp.

Convallaria majalis

Primula? umbell

Pinguicula

result
of disturbance

Germany

from alps

- Dryas octopetala*
- Salix purpurea*
- Tragopogon* (dark yellow)
- Gilia borealis*
- Polygonatum multiflorum*
- Orechis militaris*
- Astrantia major*

from alps

- Alnus incana*
- Valeriana*
- Alectrolophus* (*Rhinanthus*)?
- Plantago alpina*?
- Tetragoniae siliginea*

Gravel terrace dominated
by *Salix*, *Alnus*.
occ. *Populus tremula* no pine
Orechis militaris common.

- Orechis latifolia*
- Chrysanthemum leucanthemum*
- Thlaspi aquilegifolium*
- Maxima vulgaris*
- Potentilla silvestris*

several terrace levels,
1 m. or more apart, different
stages in dev. of pine
open forest.

- Rosa alpina*
- Berberis vulgaris*
- Bistorta laevigata*
- Petrosites nivosa*
- Viburnum opulus*

a little *Picea*, locally,
brought from alps by river.

Euphorbia

affected by *Puccinia* form
elongate erect branches with
broader winter more
scattered leaves.

Hypoxystis tuberosum

away from river, on
higher terrace - an almost
dense pine forest to 20 m.
little undergrowth,
except some *Ligustrum*
Lonicera alba

- Crataegus*
- Anemone vulgaris*

flat open plain bet. two
fir meadows - surrounded
by low hills, these densely wooded.
mostly spruce + beech.
spruce mostly planted and
reproducing

~~forest~~

Up the valley *Picea*
tends to invade meadows.
Meadows in beautiful
flower.

Königsdorf

Above Königsdorf on
rolling to hilly land,
mosaic of meadow
with patches of *Picea*
• *Fagus* forest, was oak, esp. rows.
in Munich 500-600 mm
Königsdorf 900 m.

Steep mountain slopes
above Biachl are mostly
densely wooded with
Picea, *Fagus*, etc. in
an irregular mosaic.
Snow on higher peaks.
Timber line on first range
1400 m. Some clearings.

Baroque architecture very
characteristic. Benediktbeuern
church and enormous
monastery a good example.

Photos of landscape and
flowering meadows near
Benediktbeuern.

- Large open marsh ^{from lower side} ~~at bottom~~
of Rochelesee, cut for hay, with
a few scattered trees, local
peat bogs.

Above Rochele see very abrupt
limestone mountains. *Picea* and
Fagus forests on them, very
irregular mosaic. Considerable
Acer pseudoplatanus.

Beech forest with some
Picea, *Acer pseudoplatanus*

Polygonatum verticillatum

shrub

Daphne mezereum

Hedera helix trilobata

Maianthemum

Linaria europaea

Melica vulgaris

Grenanthes pyrenaica

Fragaria vesca

Mercurialis perennis

Lysimachia nummularia

Belamcanda

Adonis vernalis

Phyteuma

Cephalanthera

Neottia

Asplenium odontatum

Ranunculus montanus

Carex

Oxalis acetosella

Lilium martagon

Salvia glutinosa

Pedicularis

Carex pilulifera

Dentaria

Dryopteris filix-mas

Valeriana montana
Corallorrhiza enata
Primula elatior
Aquilegia
Hedysarum
Lactuca muralis
Melica nutans
Gaultheria sylvatica

This seems to be about the general vegetation on the dolomite slopes.

Harvesting of timber is taking place selectively.

Pase and view of Walchensee photos (last 4) of Walchensee forest and mts. around it. Mixed beech, maple, spruce found on steep slopes of dolomite.

Bet. Kochel and Schlehdorf extensive marsh with *Phragmites*, local areas of sedge bogs with *Carex* sp., *Eriophorum polystachyon*, etc. clumps of *Salix*.

Betula along road embankment planted. Varying to wet meadow with *Ranunculus*, *Melandrium*, *Rhinanthus* on glacial outwash plain. (most in lower layers, see Hensh).

Beyond Schlehdorf toward Meersse, flat meadow surrounded by partly wooded hills. Glacial ponds.

Dense *Picea* forest with almost nothing beneath on low hills. Flat-bottomed valleys with ~~meadows~~ meadow vegetation - *Aegopodium*, *Trollius*, *conspicuum*, extending up on low hills, with scattered *Quercus petraea*.

Anthriscus exceedingly abundant, *Tragopogon*, *Ranunculus*, *Chrysanthemum leucanthemum*, *Melandrium*, *Hieracium pratense*, *Galium* cf. *vern*, *Festuca elatior*(?), *Trifolium pratense*, etc. in great luxuriance and abundance. Thickets along streams Ohlstadt.

Mts. rise very steeply like a wall from near here. Lowest forests on this pure *Picea*. Then *Fagus* with *Picea*. on tops pure *Picea* again.

West of Ohlstadt on ~~exterior~~ marshy meadow, cut for

hay. Many small haystacks
also many small barns for
hay storage.

Some spots in wet meadow
have *Trollius europaeus* in
abundance, *Sanguinaria*,
Ranunculus, *Orechis latifolia*,
Pimula farinosa,
Carex spp., *Equisetum*,
Polygonum *Erythronium*
clumps of *Felix*.
Large areas of *Phragmites*,
where it is very wet.

Moraine
n. of this rolling, low
fine gravel with grass,
locally cultivation, thickets
patches of *Pinus* forest.

East through Eberdingen
the hilliness increases a bit,
somewhat more forest.

Near Leibshaupt - some birch
forest.

Sternbergersee - narrow
belt of *Phragmites* on shore
Where not occupied by dwellings
and villages there are meadows
& and planted forest back from
west shore of lake. On slopes
there ~~can~~ are thickets and

forests of slender saplings.
Some patches of swamp
in low spots somewhat
away from the lake.

Below Sternberger see
is also a large marshy
area of glacial outwash.

Extensive *Pinus* forest
on road bet. Sternberg & Munich.
Forsternieder Park.

The general pattern of
forest distribution on the
moraine area has little to
do with soil characteristics.
steep slopes are generally
in forest. Otherwise it may
roughly be a matter of
distance from a village.
around a village the closest
lands are likely to be
cultivated, next in meadow
or pasture, farthest away
in forest.

May 21 - Würm River just north of Starnberg
in deciduous forest on flat bottom of wide ravine cut in moai

41795 *Asarum*
common

, 96 *Asperula odorata* L.
occasional

May 21 - Puppinger Au,
Puppinger, 2 km. w. of Wolfratshausen

, 97 *Galium boreale* L.
rare in low open *Pinus sylvestris*
forest with juniper and *Erica*
on calcareous alluvium.

May 21 - above Kochel-See
below Pass to Walchen See
in *Fagus* forest with *Picea* and
Acer, on thin soil on dolomite.

, 98 *Bellidiastrum*
common

, 99 *Corallorhiza enata*
rare

41800 *Melica nutans*
common

, 01 *Carex pilulifera*
common

, 02 *Carex* ~~spp.~~
occasional

rhizome prostrate, creeping
on surface of ground, with
faint ginger odor; flowers
dull maroon within, vigorous
stems erect from
yellow prostrate rhizomes;
flowers white; "waldmeister".

erect; flowers white.

rays white.

pale green, Tepals yellowish,
lip white.
glumes deep purple, lemmas
green.

May 23 - rail trip - Munich - Hannover - Nienburg.

left Munich 8:15 a.m.

Travelled through a flat plain, in ~~cattle~~ meadow and cultivation, locally wooded.

8:35 Dachau

some low hills, mostly in grain fields, rougher parts wooded. Of fine alluvial material.

8:39

still rolling hills, some rather extensive patches of *Picea* plantation, tall and dense.

These continue, alternating with large open areas of grain, some meadow, without hedges and with trees only rarely.

Occasional villages with trees and streams ~~wet~~ lined with bushes and trees.

8:47

same type of landscape, trees (*Quercus*, etc.) more common. Some flat valley bottoms seem marshy, or at least somewhat wet.

Hay-making in this area presents some difficulty and the cut grass is draped over frames or

stakes with cross arms to dry. The low wet flat meadows are quite colorful with flowers. The soil in these is very black.

8:53

The amount of forest planting is less, and more confined to rough places and escarpments. The route follows a flat valley bottom with rolling hills on either side. The wet meadows have cattle grazing them but do not appear to be very heavily grazed.

8:57

The amount of forest in the distance is greater.

The patches (small) close to the rr. are of *Quercus*.

8:58

Hop fields interspersed in grain fields on rolling hills. Wires strung on tall poles.

8:59

Fairly extensive area of forest, partly *Picea* partly low irregular oak. *Cytisus* in openings and along tracks.

9:00

More hops.

9:01

Extensive marshy plain with some drainage ditches.

- 9:02 small town. *Populus* planting.
(72 km. from Munich)
- 9:04 flat country as far as visibility in all directions
(visibility not too good, thin fog.) ~~to~~
- 9:05 same, with some marshes and heathy areas.
Oberstimm.
Otherwise mostly cultivated.
- 9:08 Ingolstadt. Left 9:16
Fruit trees very abundant in suburbs. ~~to~~
- 9:18 crossed Danube. Lambrequins abundant on n. embankments and waste spots.
- 9:22 flat cultivated plain on left, very slightly rolling, slightly higher ground on right. Occasional very small thickets, rows of trees, trees around villages, mainly open, no hedges. Soil very dark brown.
- 9:28 The land is more rolling, still open and cultivated.
- 9:31 some *Picea* plantings, admixture of *Quercus* and other broad leaf trees.
- 9:34 hilliness increasing somewhat.
- 9:35 Extensive forest, mainly planted *Picea*, but some birch, ~~and~~ beech, and oak. Country becomes

9:37

9:38

9:40

9:47

9:47

9:48

- quite hilly.
some beech forest.
appear to be dolomite.
Flat-bottomed small valley, cultivated. Hills partly wooded, partly in pasture, locally cultivated. Occasional small cliffs. A few pines, some oaks.
beech forest more abundant.
hilliness decreases somewhat.
Proportion of forest decrease.
R. follows a winding valley of a small river, between low cliffs, a ravine cut in a plateau.
Then a long tunnel and another similar valley.
Cliffs ^{slopes} wooded with beech with admixture of pine, spruce and oak. (Possibly the same valley ~~at~~ the n., avoiding the more extreme meanders by tunnels and cuts. Cliffs are certainly dolomitic.)
either dolomite or chalk.
some grassy slopes with abundant pine.
Bluffs with mixed beech and oak forest. Narrow flat bottom cultivated and meadows. Gentle slopes grassy, with

- bushes, hedges, etc.
- 9:50 More and more pine, at least locally.
- Some low scrub, probably after clear cutting.
- 9:51 Bluffs have a mixture of spruce and beech.
- 9:52 Valley broader, cliffs and bluffs largely give way to gentler slopes, these still partly wooded.
- 9:54 Treuchtlingen. left at 10:00.
- Hills with forest principally of *Fagus*.
- Then rolling locally hilly country with meadows, cultivation, patches of wood on hills, soil on flat land a dark reddish brown. Hay still being cut by scythe. A few widely scattered trees in the broad valleys, mostly along the ~~the~~ stream in bottom.
- 10:03 Weisenburg
- Rolling mostly open landscape. A few thickets of *Quercus*, *Populus* etc. and patches of *Picea plantana*. More hops, interspersed with grain fields.
- 10:14 Pine plantings.
- 10:17 Pleinfeld
- 10:19 extensive pine plantations. Soil sandy. *Cytisus* locally

- abundant and in full bloom. Natural reproduction is mostly oak, a little *Populus tremuloides* and *Betula*.
- Mulhausen
- Some open cultivated areas. ~~wood~~ and meadows. Mostly pine woods.
- Open land increasing.
- Georgenroth.
- Mosaic of pine and open land.
- Continues irregularly to Schwaibach
- Riechelsdorf
- broad valley surrounded by pine woods.
- Increasing cultivation, less woods.
- 10:36 10:39
- 10:47 Nürnberg. left. 11:00 a.m., *Lamium nigra* very common in waste places and on r. embankment paths.
- Orchards around house. Much residence area. Some cult. fields.
- Pine forest in distance to left. also in farther distance to right. Generally rolling cultivated land, gray sandy soil. scattered oaks or oak thickets.

- 11:03 Open rolling landscape, small patches of pine and oak forest. Much pine in distance.
- 11:11 Pine plantations on low hills. Valley bottoms in meadow and cultivation.
- 11:12 Some hills also in grain. Understory of oak in pine plantations, mostly rather sparse, except where pine is thin. Where it is very thick there is little even of herbaceous vegetation under it.
- 11:16 Pine over most of hilly area.
- 11:17 Open grain fields on rolling land to rt. pine on left. Then a small town surrounded by cultivated fields, esp. grain, pine plantations farther away.
- Salvia pratensis* (?) (dark purple) and *Melandrium* (bright rose) abundant on embankments and roadsides. Almost all in pine plantation. Most of these pines are well grown in height, but still of pole size, self pruned.
- 11:27 Open country around a town. Oak and *Crotonaegus* thickets on rough spots. Fruit trees around Neustadt houses in suburbs.

- 11:25 Rolling open broad valley. Pine on low hills around it.
- 11:26 Rolling landscape with mosaic of patches of pine in grain fields and meadows light brown soil, apparently sandy. Meadows in low flat areas, yellow with *Cannanulus*.
- 11:28 Pine not common except in distance to rt. Low oak forest on low hills to left. Broad valley between with grain fields and meadows. Village. Some alfalfa.
- 11:30 Forest patches on both sides mostly oak. Slight admixture of pine.
- 11:32 Markt Bibart Broad valley - cult. & meadow. surrounded by oak forest on low hills.
- 11:35 Mosaic of oak forest and cult. grain fields.
- 11:36 Open rolling land. Calcareous. mostly to grain fields. and alfalfa.
- 11:37 Higher hills in distance, esp. to rt. and ahead. Tops wooded. Iphofen. (photos)
- 11:40 Open rolling cult. landscape. Very little wood.
- 11:42 Mannerheim (photo)

11:38 Area of mixed pine, oak, Robinia forest.

11:40 Town - Kitzingen
in open rolling country, crossed
large river. Apparently main? ^{12:38}
cult. rolling land, some
small hedges and thickets,
but few. A few scattered small
oaks. Soil light reddish
brown.

11:49 Area of open oak forest with
thick under brush of Corylus,
etc. Generally rolling open
landscape. Thickets more
prominent on slightly rougher
land. Then open cultivation.

Dettelbach

11:53 Patches of oak forest in open
rolling country.

11:59 Jct. (missed name)

11:57 Oak forest on left, grain fields
on rolling land to rt.

Open rolling hilly country.

12:00 ~~small city~~. Würzburg. Left. 12:23.
Vineyards on south-facing slopes
terraced. Staked + wired.

Main Valley - rather steep
sides cultivated, fruit
trees abundant, mostly
scattered rather than in
orchards. Vineyards on rt.
even on steeper slopes, but
not on bluffs - where noth-

is exposed. Top of ridge
on left, wooded. also that on
right a bit farther on.

Interesting looking low cliffs
of flat rather thinly bedded
shale + conglomerate - possibly
calcareous - pale gray.

Bare except for low rock
plants.

Apparently limestone, as
there is a cement factory.
Vineyards poor and ~~not~~ less
numerous. Slopes brushy.
Changing to forest - mixed pine + oak
on both sides. pure oak on left.
Grain fields + meadows in bottom
of valley.

Gernsund. Both sides of valley
steep, wooded with oak.
considerable barge traffic on
Main.

Left at 1:00 p.m.

Left Main up small valley
between hills thickly planted
to ¹⁰⁷ ~~Picea~~, then on it ^{thick} ~~oak~~ ~~oak~~
forest, patches of pine. Then
same on left, then gentler
slopes with grain fields.
oak forests a ~~bit~~ little way
back on left, immediately
on rt. on steep slope.

Cultivation, with hedges
on both sides.

Tunnel

- 1:10 Thick forest on both sides, irregularly mixed, oak, pine, beech, spruce. Then an area of cultivation on gentler slopes. Then pine forest on it, pine & beech on left, patchy. Some patches of cult. on rt. Then open slope on left and right. More thick mixed forest. Tunnel. Mixed forest on rt & left. Steep wooded slopes. Gentle cult. slope. Hedges. Reddish sandstone.
- 1:20 Slopes cult. semitempered with hedges. Wooded above. Both sides of valley wooded. Beach with pine. Then lower slopes cult. Hedge fairly general. semitempered. *Dryopteris filix-mas* common.
- 1:23 Climbing on side. Village with pine ruined castle on other side of valley. Valley broad, cultivated, ridge tops only wooded. *Crataegus* hedge. Long tunnel ~~Steppenitz~~ ^{Tunnel}. Sterbbitz.
- 1:32 High rolling grain fields.

- Pine woods on hill tops. also beech & spruce mosaic. Fruit trees along roads. Ramholz Tunnel. Soil distinctly reddish. Proportion of forest high on hilly ground. Mixed deciduous. Robinia on cuts. Some patches of spruce and pine. Mostly oak with admixture of other things. Some areas of beech, some ash. Brandenstein Tunnel. Beech forest on rt. Open valley on left. Then hilly country with beech forest. Valleys grassy. Open hills on left. some thicket. Bush wood on rt. some planted larch. Back on limestone. *Crataegus* hedge in grassy covering. Oak woodland rough place. scattered oaks in fields, also fruit trees.
- 1:47 Pine woods, some oak and beech admixture, some beech forest.
- 1:49 More red sandstone & shale. Oak woods.
- 1:50 Rolling hilly country meadow grain fields, patches of woody ~~hedge~~ hedges.
- 1:54 Frieden. In plain is an

enormous conical pile of white material, probably a mine dump. This on left.

1:57 Neubhof

Large forest in distance on both sides. Then much closer. Large patches. Some oak. Mostly coniferous. Both spruce + pine.

2:01 flatter areas in grain and meadow. Hills in spruce forest. Flatter parts are wet meadow.

2:02 Bronnzell.

landscape flattens out.

2:09 Türla. left. 2:10

Open country with scattered wooded hills. Some hedges of Prunus + Crataegus. (3 photos)

2:17 Götzenhall (2 photos)

Many small villages in rolling plateau.

Pine plantations on surrounding low hills. also some beech and birch forests. Some mixtures.

2:21 Some spruce with a little pine. Then pine, and oak. + mixed oak + beech. all on st. Open wide valley on left. Woods on ridge in distance.

2:24 Wide rolling open country. a few trees and hedges very locally.

2:28 Flat narrow valley with

wooded hills, mixed pine and oak - some beech. Locally planted pines.

2:33 Forest principally beech on st. Pine on left. Then pine and beech on it. Open rolling grain fields on left.

2:34 Pine wood on hills to st.

Neubrunnen. Open valley with meadows and grain fields. Patches of oak wood. Salix along streams. Flat valley bottoms are flowering meadows.

2:38 Hills with oak forests, some mixture of pine.

Then another winding valley, lower or more gentle slopes in cultivation, bottoms in meadows, willows along stream ravines, some forest on hilltops.

2:42 Bad Hersfeld. Oak forest on some hills, some admixture of beech. Some others with planted pine and spruce.

Valley narrows. Hills rounded, almost entirely forested with mixed coniferous and deciduous forest.

2:45 Mixture of wooded hills and cultivated valleys + slopes.

Wide flat valley with meadows, grain field, surrounded by wooded hills.

2:50 Bebra. left. 3:01 took left fork toward Kassel. - no it loops back to right and crosses the other fork. Apparently we are going via Göttingen. Vast open valley around Bebra. Climbed slope above the town. Slopes are all covered with grain fields. R.R. cut wooded with Robinia. *Dryopteris filix-mas* abundant beneath. Upward patches of forest became frequent, mostly planted *Picea*. Thickets and hedge of *Crataegus*, oak, Robinia, *Balix*. Small patches of a cotton-like plant. Steep escarpments have oak woods. Patches of oak wood mixed some with pine & beech. Tunnel.

Then mosaic of grain field and forest, this locally oak, beech, or coniferous, or mixed.

Climbing, still.

tunnel

Mixed spruce, pine, beech, oak

3:13

3:14

3:18

3:20

3:23

3:25

3:30

3:33

3:34

3:37

forest. Then cultivated hills, oak forest locally and ^{mixed thickets} _{on rough places}.

Extensive rolling cultivated land. Pastures with scattered trees and shrubs on steeper slopes. Trees mostly pine and fruit trees.

Broad valley with gentle slopes, light pinkish red soil, semiteraced in many places. ~~some~~ Wooded hill and steep slopes, oak and pine, separately or mixed, cult. valleys between them.

Then open rolling valleys and hills, few trees except fruit tree occasional short hedges, oak on escarpments, willow along streams in flat valley bottoms. High hills in the distance forward to the right. Hay mts.??

Valley narrow, and steep hills and small mountain close at in, densely wooded with a patchy mosaic of broadleaf and coniferous forest.

Fairly large stream a small river meanders in bottom of valley, which

is cultivated. Robinia locally along rr. Some orchards among fields. Bad-Soden. wide flat place in valley. Werra River.

3:43 Slopes on left abrupt, dense oak woods. On rt. gentle and cultivated in lower parts, dense forest, prob. oak, above. Occasional patches of conifers.

3:44 Valley narrows again, steeper slopes forested. Crossed Werra.

3:45 Castle church on hill to left. (Ludwigstein?)

3:49 Left Werra, into hills to rt. Hills partly cultivated, partly, esp. steeper slopes, forested.

3:51 Tunnel.

Hills, densely forested with beech and pine. - oak on sunny slopes.

3:57 Cichenberg

Broad cultivated valley with villages. grain and pea fields. Some hedges (catawpa) wooded knobs, mostly oak wood. Willows along streams.

4:01 Orchards on flat ground. meadows on low-lying flat ground. Hills become lower. Less wooded. Obernisse.

4:06

4:07

4:24

4:30

4:41

4:44

4:48

Valley widens into an extensive plain, hills in distance on either side. A city on right at base of hill and on lower slope.

Göttingen left 4:16.

Broad flat valley, river terraces. Leine River. Valley all cultivated, mostly grain fields. Hills on both sides forested.

Broad flat valley still, densely forested ridge on both sides. Barley fields. Trees around villages. and some along roads.

Nörtheim. left 4:34.

Still the same broad very flat valley, intensively cultivated.

Patch of pine and of beech forest on low hill to rt. Otherwise grain fields.

Valley narrows between rounded hills, wooded in places with beech, shrub, oak, some pine. Higher hills mainly with beech forest. Hills seem chalky.

Kreienzen. left 4:51.

Flat valley with wooded ridges on either side, mostly beech. grain fields and meadows in valley and on lower slopes.

- 5:00 Freden. Waste place with much *Bambusa nigra*.
 Valley narrows somewhat (crossed Leine R.) but bottom stays very flat. Rounded hills on sides mostly have rather abrupt, densely forested slopes. Rarely cleared and cultivated, where more gentle. Flat bottom mostly meadow. Soil a gray brown, apparently rather sandy, with rather high water table. Small towns ~~sparse~~ occasional.
 5:06
 Valley widens somewhat. Hills still densely wooded above, with lower slopes cultivated.
 5:12 Valley much wider, some miles, bottom flat, but with a couple of river terraces.
 5:16 Phragmites in drainage ditches.
 5:17 Elze. left 5:19
 Relief in valley bottom somewhat greater. Flat bottom less extensive. Broad grain fields. Some ponds and marshes. Willows around these and along river.
 5:21 A low dome-shaped wooded hill on either side. A castle.

- Marienburg, on the ocean left. Nordstannen
~~A couple of miles~~
 Several similar but even lower hills in distance. Otherwise the country is now a vast perfectly flat plain. Judging by the ponds, the water table can't be more than a few dm. below the surface. Some slight undulations a short distance ~~to~~ on either side. Grain fields, small orchards, thickets, willows along watercourse, abundant marsh plants in ditches, ponds, and along streams, rows of trees, esp. along roads., some wet meadows, but most of area intensively cultivated.
 Fruit trees very abundant in residence areas south of Hannover.
 Hannover. In. 6:08
 second start.
 Suburbs are in places really like an orchard with houses among the trees. A fine patch of mixed broadleaf forest, pub. & park. Then a horribil industrial area. Then gardens, small shacks, edge of town.
- 5:26
- 6:08
- 6:14
- 6:26

- 6:30 Housing development - ugly barach, but with areas set aside for gardens, fruit trees, etc. Beyond this residences with much garden land.
Then open flat land some thickets, more gardens. Wood along watercourse.
- 6:34 A town, Seelze, with more gardens and fruit trees.
Forest across river to left. Almost continuous gardens, many houses. Residences thin out some.
- 6:36 Patch of oak forest on rt. Then on both sides.
Then open fields.
- 6:37 Small pine wood on rt. Some oak & willow also. Pine on left with understory of oak.
Open fields.
- 6:40 To rt. Open fields with rows of trees along canals. Blue lupines along embankment.
- 6:42 Row sand hill with scattered pine, then irregular mixed forest, mostly oak.
- 6:44 More patches of forest, mostly oak - open and irregular. Few cultivated land.

- mostly open, scattered villages, rows of houses.
- 6:46 Extensive very flat open grain fields. Patches of forest in distance.
- 6:47 Villages and farms. Woods on left. Patches of pine on right. Picea, young among pine.
- 6:48 Mixed woods on left. Land becomes very slightly rolling. Scattered patches of woods.
- 6:50 Flat open land, forest visible in all directions.
- 6:52 Land somewhat rolling, many patches of pine. Some oak, scattered hawthorn and oak in low flat areas.
- Mixed thickets. Some grain fields, some very young pine plantings.
- Thin black soil underlain by yellow sand.
- Row mixed forest for some distance, then openings, more forest, now tall oak, then mixed with pine.
- 6:56 Birch forest, then pine, various mixtures meadow.
- 7:00 Patchwork - cultivation, meadow, forest. Nienburg

Tüxen's laboratory. —

They have made, in all, over 800 maps, most of which have not been published.

Always a basic map based on plant associations. Then various derived maps - of water levels, of soil moisture, of forest and agricultural potential, of kinds of trees and crops that should and should not be planted, etc. These must depend on a great amount of correlation and experience.

Most spectacular thing in institute is collection of soil profiles.

Method of making them is to dig a pit, smooth off the desired profile. Then spray it with a lacquer dissolved in acetone. Allow acetone to evaporate. Then glue a cloth to this surface. Then cut away the layer of soil next to the cloth. Bring it in to lab. Lay it out on a masonite sheet, glue it down. Then shave it down to as thin as possible while still preserving the features. Dry thoroughly. Then wash well with acetone, which brings

red
villages
potatoes
rye

sugar
beet
Barley
wheat
meadows

out the color of moist profile. Frame and cover with cellulose acetate film well away from surface.

Tüxen illustrates some late Pleistocene and post-Pleistocene history with these that is most remarkable. Also some vegetation - soil relations, roles of vegetation in profile formation, also vegetation - soil - primitive man relations.

kind of lacquer and glue?

Ruth-Tempel-Worke
Hamburg-Wandsbek
Walddörferstr. 136

Plain of the Weser consists of a terrace and a flood plain. The terrace is of sand. nat. veg. is ~~fagopyrum~~
~~quecetum~~
~~strobilaceum~~. Flood plain, of reddish loam deposited about 1000 years ago when upper valley 150 km. a.s.l. was deforested and eroded. natural veg. Fraxino-Alnetum.

Presently cultivated completely. Characteristic landscape of hedges of Crataegus, Prunus spinosa, bambusa, etc. and scattered large Fraxinus excelsior. Within last years these, esp. the hedges have been almost eliminated to increase land for cultivation.

May 24 - on s. of Nienburg
on sandy moraine as
dense plantation of pine
and Calluna heaths. Podsol.
Querceto-Betuletum ^{nat.} veg.

On less sandy soils the
nat. veg. is Fago-quercetum -
now entirely cultivated.

Glashof - 2 photos of houses
typical architecture.

On richer soils pH 6-6.5
Querceto-carpinetum, on
terrace of ~~Fennek~~ A. Aller R. Reins
but mostly Fago-quercetum

On sandy soils the landscape
is a mosaic of blocks of
pine plantation separated by
smaller areas of cultivation
"dehiscenzen landschaft". This
is to protect the open areas
against wind erosion.

On the Aller flood plain
are areas of Querceto-Betuletum
and some pure stands of
Myrica gale. Wet areas. Myrica
favoured by fire. Permanently
wet from high ground water table.

Fraxino-Ulmetum wet from
inundation.

Autobahn to Hamburg -
the grass-cover on roadside
and also the tree planting
done according to a
phytosociological map.
Resulted in far more
successful stabilization
of sand and better growth
of trees.

Correlations of associations
with soils result of thousands
of observations, with ground
water levels result of
hundreds of observations.

Querceto-Betuletum landscape
on moraine dominated by
Pinus sylvestris plantations
with, where not cut out,
understory of Betula and
Quercus. Areas of Calluna
and of ^{planted?} Cytisus scoparius _{subsp.}
Festuca ovina planted on
shoulders of highway.

This is a strongly podzolized
~~soil~~ soil.

Toward Hamburg change in
landscape - relief greater, soil
brown. pure Fagus forest ^{also} ~~with oak~~.
This moraine is a bit younger.
soil not quite so poor.
Much less birch.

approaching Hamburg -
a vast alluvial plain of Elbe
Peaty soil - Alnetum.
Salix alba common.

This on the outer parts
near moraine - wetter and
more humus.

Near river drier, less
humus. *Fraxinetum* - *Ulmetum*.

Salix forest along
river. *Phragmites* marsh
Tides 1 m. or more.

The *Fraxinetum* slightly
higher than *Alnetum*.

Beyond Hamburg - first
the middle moraines with
Fago-Quercetum. Then an
older moraine landscape
rolling, lacking forest,
fields separated by *Catalpa*-
Corylus hedges. Rotation on a 7 year
cycle bet. grass and crops.
Hedges cut back when crops
are grown, allowed to grow up
during grass period, for protection
and to serve as fences.
still *Fago-Quercetum*.
- also *Fraxeto-Carpinetum*

Hedges become largely
Corylus toward Kiel. All these
hedge have a low earth wall
at base, deliberately built and
repaired every 7 years.

The relief is, in general,
inversely related to the
age of the moraine. The
fertility also. But much
local variation in fertility
esp. in young moraines.
Differences gradually
smoothed out.

In young moraines there
are many ponds and bogs.
few in old moraines, as
they have been filled in during
the long period of erosion
as the terrain has been flattened.

Hedges on young moraines are
dominantly *Corylus*.

Fraxinetum indicates a rich soil.

In young moraine one
sees characteristically over
the hedges into the fields,
because of the relief. In old
moraine, the fields are
hidden by the hedges.

May 25 - Schleswig - Tiergarten
A beech forest with
admixture of *Picea* (planted)
Geranium phaeum -
Rubus spectabilis?

Some *Quercus*, *Carpinus*, *Tilia*

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Roadside

- Geranium robertianum*
Carex
Urtica dioica
Tilia platyphyllos
Vicia
Galium aparine
Paraxacum officinale
Rumex crispus?
Melica uniflora

In wood

- Asterula odorata*
Maianthemum bifolium
Veronica
Luzula pilosa
Athyrium filix-femina
Stellaria (frag fl.)
Anemone nemorosa
Carex sylvatica
Fagus sylvatica (ind. abundat eeling)
Fraxinus excelsior
Milium effusum

"Forstkultur" = forstliche Bezugsgenossenschaft
 Frankfurt/Main, Bodenbohrstock, 1m lang

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Siegfried Zingel, Reinbek bei
 Stell

! dry.
t

"Forstkultur" - forstliche Bezugsgenossenschaft
 Frankfurt/Main, Bodenbohrstock, 1 m lang

Dr. Siegfried Zingel, Reinbek bei Hamburg.
 Bundesforschungsanstalt für Forst- und Holzwirtschaft,
 Abteilung Forstschatz

~(s) Carex
 Fraxinus

Viola sylvatica
 Epilobium montanum

"Forstkultur" - forstliche Bezugsgenossenschaft
Frankfurt/Main, Bodenbohrstock, 1 m lang

Dr. Siegfried Zingel, Reinbek bei Hamburg.
Bundesforschungsanstalt für Forst- und Holzwirtschaft,
Abteilung Forstschutz

Roadside

- Geranium robertianum*
Carex
Urtica dioica
Tilia platyphyllos
Vicia
Galium aparine
Paraxacum officinale
Rumex crispus?
Melica uniflora

In wood

- Asperula odorata*
Maianthemum bifolium
Veronica
Luzula pilosa
Athyrium filix-femina
Stellaria (large fl.)
Anemone nemorosa
Carex sylvatica
Fagus sylvatica (incl. abundant seedlings)
Fraxinus excelsior
Milium effusum

"Forstkultur" = forstliche Bodenverschaffung
 Frankfurt/Main, Bodenstock, 1m lang

4. Bißfeld Fingel, Reinbek bei Hamburg; Bundesforstschungsanstalt für Forst- und Holzwirtschaft, Abteilung Forstschule

Soil profile taken with this instrument was sandy, light brown, somewhat grayish in upper few centimeters, not well differentiated into horizons.

A pit dug in a flat area of open beech-oak mixture - light yellowish brown.
 (Trees almost 30 m.)

About 60-70% *Fagus*, 30-40% oak.
 No shrubs, ex saplings of *Fagus*, *Tilia* (very few), herbs -.

- a *Milium effusum* Lorbeerwald
 c *Stellaria holostea*
 c *Carex sylvatica*
 c *Asperula odorata*
 c *Geranium robertianum*
 c *Cirsaea lutetiana*?
 la *Oxalis acetosella*
 la *Anemone nemorosa*
 l *Rubus idaeus*?
 l *Veronica montana* *V. chamaedrys,
 c *Panunculus lificaria*
 ~ *Lamium (yellow) galeobdolon*
 l *Melica uniflora*
 a *Festuca sylvatica*
 ~ (s) *Carpinus* *Vicia sylvatica*
 ~ (s) *Fraxinus* *Erythronium montanum*

The shrub layer here was removed in a year when beech fruited abundantly. The ground was plowed, and now there is a great crop of beech seedlings.

Soil profile

yellow brown, top few cm.
darkened somewhat,
lower part mottled
with gray and darker brown
(below 3-4 dm.)

somewhat sandy clay in
upper few inches, stiff
clay below.

a brown earth pseudogley.
(mottled from high soil moisture
(stauwasser) not ground water)

Another pit, in same
forest, 150 m. away, in a
peaty area.

Upper 4 dm. a dark brown
mottled with ashy gray ^{fine} sand,
dark part mostly peat but with
some fine sand. *Leucobryum* on surface

Below this a fine sand with
some clay, mottled red brown,
yellow brown, and gray.

Sharply distinct from A
 horizon. Some iron concretions
 apparently the beginning
 of an oyster layer. or an
 old one broken down.

H. L. Heck
~~T. S. Reutter~~

From map by ~~T. S. Reutter~~
The eastern half of
Schleswig-Holstein seems
to be young moraine, the
western half older and
alluvium & maritime marsh.

Division about the long
axis of the isthmus.

May 26 - trip by bus - Schleswig to
Flensburg & Glucksburg.

Wet marshy meadow along
south shore of Schlei across
from Schleswig.

Moraine - rounded hills
a few m. relief. Hedges of *Corylus*,
Crataegus and various other
shrubs and trees, cut the
landscape into small fields
of 1- several acres. No forest
but one or two fields seen newly
planted to *Picea*.

Giby - some patches of forest -
Picea, some admixture of
broadleaf trees, esp. around wagon.
Only locally.

Holm,

New hedges are 1 species. Old
ones, to 200 years, up to a dozen
species of shrubs.

Büttsee - stop.

small lake surrounded by
marsh of *Carex striatus*
with fringe of *Spiraea lacustris*

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1961 Germany

May 25 - Schleswig

Carex arenaria

on sand bank, edge of Schlei

- ~~is~~ forest of *Fagus* and *Quercus*
on moraine.
- ✓ 04 *Veronica montana*
in edge of thick
- ✓ 05 *Veronica montana*
in soil plowed earlier in
- ✓ 06 *Veronica chamaedrys*
in soil plowed earlier in
- ✓ 07 *Luzula pilulifera*
common in soil plowed earlier in
- ✓ 08 *Stellaria holostea*
very common on soil plowed earlier

Schleswig

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branches ascending

flowers bluish violet

flowers bluish violet

small tufts, culms spreading-
ascending.prostrate with ascending
branches, petals white.

on margin of water. also Phragmites.
 shrubs of *Salix* sp. scattered
 irregularly. *Carex rostrata*, etc.
 Found around margin of
 10 m. *Juncus balticus*. *Luzula campestris*
Anthoxanthum odoratum, *Cephaelis*:

Marsh is discontinuous
Scirpus has come in very
 recently with increasing
 entrapment. *Ranunculus celeratus*
 2 swans.

12 m. Up slope very slightly on
 dry meadows

Aira caryophyllea
 " *praecox*
Festuca ovina vulgaris
Hieracium pilosella
Ornithopus purpureus
Vicia angustifolia
Cerastium semidecandrum
 " *arvense*
 " *caespitosum*

Prunus avium
Blutrichum juniperinum
Hypochaeris &
Luzula campestris
Anthoxanthum odoratum

Beyond here - occasional
 grassland

Very narrow point in ditch
 Phragmites marshes, but very
 small. Bluffs about 5 m. high

of sandy morainal material
Archangelica officinalis
Anthriscus silvestris
~~*Isodon palustris*~~
Cirsium avens ^{triplochiton} *maritimum*
Carex stans ^{gr. malpina}
Convolvulus sepium ^{Coclearia} ^{officinalis}

Phragmites zone
 Scirpus maritimus zone
 Carex stans zone
 Archangelica zone

The Anthriscus is only
 shoreward, becomes dominant
 above the Archangelica.
Archangelica ^{area} is somewhat
 nitrophilous

wooded
 On bluff Anthriscus,
Rosa sp., *Alliaria*, *Vitica*,
Artemisia, *Dactylis*, *Lamium album*,
 trees + shrubs are
Tropaeolum, *Corylus*, *Populus*,
Crataegus, *Lambium*, *Quercus*,
Crataegus, *Prunus spinosa*.

Grassy bluff
Vicia angustifolia
Hieracium pilosella
Trientalis procumbens
Trofolium procumbens,
Laxifraga granulata
Centaura scabiosa,
Ononis repens

Dactylis glomerata
Festuca minima
Plantago lanceolata
Arenaria serpyllifolia
Vicia lathyroides
Aira caryophyllea
Pimpinella saxifraga
Hypericum perforatum
Thymus pulegioides
Mysotis hispida
Vicia hirsuta
Arrhenatherum elatius
 Crossed on small fens

Kösel.

sandy moraines.
 Patch of beech woods.
 larger fields.

noor - arm of Lechle

Phragmites forms a floating mat, pulled loose by ice in winter.
Cytisus scoparius common locally along road.

Morby - windmill much like those in Holland.

Riesby.

local name for hedge-brick because ~~the~~ the shrubs are broken or knocked every 7 years.

A small beech wood.
 several such patches

To be seen in middle distance.
 Houses brick with thatch.
 Marl pits ^{were} common.
 but now mostly filled.
~~so~~ Riesby
 Patches of wood very sparsely scattered.

Cultivation of barley, wheat,
 sugar beets. Meadows.
 Marl pits filled with water, surrounded by bushes.

Many more are marked on 1/25,000 maps than are now evident.
 Winnemarsh.

In hedges *Corylus*,
Lyringa, *Salix* & *ab.*,
Crataegus, *Lambucus*,
Prunus spinosa, *Rosa*,
Euonymus, *Quercus*,
Salix caprea, *S. purpurea*?

Schwonsburg 15 ft. salt a less.

Marshes of Phragmites (photo)
 bring water.

Juncus maritimus (photo)
 with *Armeria*. hummocky for grazing. *Aster tripolium*.

Festuca rubra, *Juncus gerardii*
Plantago maritima, *Plantago*
cognophila, *Leymus maritima*
 form a dense sod, glauc

Armeria maritima

Kappel. crossed Lohlei.

Fish Wiers in narrow part of Lohlei. Herring which are smoked here.

Patch of beech wood back of town. Mostly small fields and gardens. Fruit trees just out of town around houses. Several patches of forest: Melico-Fagetum.

Goats are all dark red. Local breed.

Patches of rape in full flower. A very little rye. Mostly barley, wheat and meadow oats.

wheat, rye, one form of barley sown in fall. Oats a reform of barley in spring.

Getting

Flensburger Fjord on rt.

Coast low.

Aesculus hippocastanum is a common planted tree near houses.

Patchwork of fields and hedges on gently rolling ground. *Fraxinus* common.

Steinbergbörde

Relief very slight, but still a young moraine.

Fields rather large.

turned right before Nübeck.

past Rothenburg a patch of beech forest. Holstroppe ^{meadow} tall dense forest, with oaks, ash, *Carpinus*.

Where cutting has been done on edge, much reproduction of beech.

There is no shrub layer in dense part of forest. Canopy almost complete, about 25 m.

Trees to 5 dm. dbh. spread 2-5 m.

- la *Melica uniflora*
- a *Asperula odorata*
- : *Fumariolus pinnatifidus*
- l *Impatiens noli-tangere*
- g *Anemone nemorosa*
- l *Lstellaria holostea*
- c *Viola silvatica*
- c *Milium effusum*
- c *Veronica montana*
- l *Carex sylvetris*
- r *Neottia nidus-avis*
- c *Geranium robertianum*
- la *Oxalis acetosella*
- l ~~*Lstellaria Mohringia trinervis*~~
- c *Ranunculus lanuginosus*
- o *Lonicera europea*
- o *Circaea lutetiana*
- ~ *Epilobium montanum*

- ~ Dryopteris filix-mas
- ~ Primula elatior
- ~ Stellaria nemorum ssp. montana
- ~ Primula acaulis
- ~ ~~Stellaria nemorum~~
- b.c. Stachys sylvatica
- ~ Stellaria nemorum sp. glabridospa

Two associations are represented here - Melico-Trysanthemum and Querceto-Carpinetum

Neukirchen

No birch seen so far today
Laburnum occ. planted as ornamental.

Kalleby

Tulips still in flower.

Windmill - formerly much more numerous to grind grain.

Beyond Nübel some hedges have been replaced by fences of barbed wire.

Dollern.

All cows are dark red.
Turned off Hwy. to it.

Westersholt

Landballigan

Coastal terrace

Pebble beach with *Arenaria pectinoides*

Cirsium

- Festuca rubra
- Taraxacum vulgare
- Atriplex latifolia
- Potentilla anserina
- Achillea millefolium
- Elymus arenarius
- Tenacetum
- Petasites

Slight beach ridge
back of it marshy meadows.

- Alopecurus geniculatus
- Potentilla anserina
- Psathyrotes annua
- Poa annua

Zizaniopsis miliacea

Festuca rubra

Zizaniopsis miliacea

Carex stans

Carex distans

Infusaria fragiferum

Glaux maritima

windrows of dried *Fucus* & *Zostera*
on beach.

Near edge of wood *C. distichia*
patches of *Carex paniculata*
with *Caltha palustris*

Ranunculus aquatilis

Lemna aquatica

Anthoxanthum odoratum

Dianthus

Bromus radicans

Taraxacum sp.

Lycopus flexuosa

Myrtus communis
Ceratodon purpureus
Atriplex patula
Arenaria repens

Geochloë virginicus
Lathyrus palustris

Depression a ditch
with Eriophorum

Acereto-Fraxinetum
wood of Acer ~~platani~~^{pseudoplatanus},
Fraxinus excelsior
Fagus Alnus glutinosa
fambricaria
Prunus spinosa
with
Equisetum pratense
Urtica dioica
stellaria nemorum
Asperula odorata

on the steep slope Fago-quercetum
with Populus tremula (^T_a orientalis)
sorbus aucuparia
Quercus on Betula

Vaccinium myrtillus
Maranthemum
Luzula sp.
Asteromoe nemoralis
Deschampsia flexuosa
Trientalis
Lonicera peralyneum
holodays virginicus

Wet meadows are
Bromus racemosae (allianz)
apparently on peat or
muck, as the ground
trembles under foot ^{yes.}
Many species.

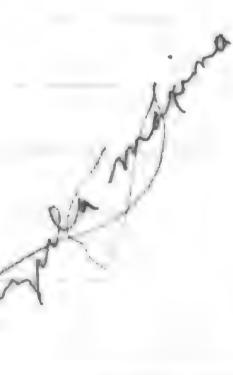
Scattered alders. If these
meadows are not mown
Alnus will soon dominate.

(photos and roll)

Landballigholy
Fairly level rolling moraine.
Toward Glucksburg the
relief becomes greater.
Ulstrup

Glucksburg - (stop)
Harbor lined with
Phragmites.

Beech forest with
some oak, maple.
Abundant saplings of
Acer 1-2 m. forming shrub
layer. quite patchy, absent in sargaves.
Herb layer of beech seedlings
 I. a. Anemone nemorosa
 n. Melica uniflora
 n. Asperula odorata
 I. Gellaria holostea
 I. Gellaria nemorum
 a. Milium effusum
 e. Mercurialis perennis
 I. a. ~~Trientalis~~ ^{myrsinoides}



Where there is a hole in canopy shrub layer is 3-4 m

- ✓ ed *Luzula maximus*
- ✓ ~ *Agrostis capillaris pratense*
- ✓ la *Peschamia plicosa*
- ✓ ea *Salix acutiparia* (near edge)
- ✓ ea *Maianthemum bifolium*
- ✓ c *Fragaria europea*

~ association, a subassociation
acid one plants marked &
rather sharply distinct.
Anemone slightly mixed
in patches of *Peschamia*
and *Luzula*.

- ✓ e *Conium periclymenum*
- ✓ la *Vaccinium myrtillus*

Over a considerable area *Luzula maximus* is completely dominant in the ~~veg~~ ground layer no shrubs. Canopy somewhat broken. A layer of 1 dm of loose dry duff, then a dark humus filled gray sand.

Luzula-Fagion

Soil pit shows a thin black layer, + 10 cm. (^{under ch}_{duff root layer}) Then 70-70 cm. gray sand, mottles Then a dark brown layer fading quickly into a mottled yellow and gray sand-

in the dark brown layer is some (anapent) attein, locally somewhat hard. This layer varies greatly in thickness and color over in the one pit. being from 15 cm to 50 cm.

The entire profile is fine sand, with a few pebbles of flint.

Beach ~~of~~ sand mixed with shells and pebbles Much of it has no vegetation. Toward Ulva thrown off in a ~~sand~~ drift line.

Locally patches of
Elymus arenarius
Arenaria pedunculata
or *Taraxacum* sp.

Agropyron repens
Festuca arundinacea
Potentilla anserina
Festuca rubra
Rumex crispus
Calamagrostis epigeaeus

planted patches of *Rosa rugosa* - dense, low. 3-4 dm high

locally covers beach flat completely. Flowers very large, a beautiful deep rose color.

Murwq
Flensburg

Leaving Flensburg the road follows the edge of the young moraine. On the left is the hilly land of the younger moraine, on the right, and then on both sides is the flat land of the old moraine. Brown soil on ~~young~~ moraine, violet on old moraine. Pine and spruce plantings. Mostly open fields and meadows with hedges, a few patches of woods.

Terminal moraines and very flat outwash plains from them - young morain.

Some small dunes on outwash plain.

Rye and meadows.

Some small ponds and plantings of Larix.

156 1961 Germany

May 26 - Langballigholz,
3 km. E. of Gluecksberg

- 41809 *Ulmus scabra*
on steep wooded slope on moraine gravel.
- 1 10 *Bromus mollis*
common in edges of wet meadow
- 2 11 *Bromus racemosus*
abundant in wet meadow
- 2 12 *Luzula maxima* (syn. *sylvatica*)
common in acid woods on slope
- 1 13 *Equisetum hyemale*
very local in acid woods on slope
- 1 14 *Vaccinium myrtillus* dwarf shrub; fruit immature.
common locally in acid woods or slope
- 1 15 *Polyodium vulgare* L.
rare on sandy slope in acid woods
- 2 16 *Luzula pilosifera*
common on sandy slope in acid woods
- 1 17 *Maianthemum bifolium*
abundant locally in acid woods flowers white
- 1 18 *Luzula campestris*
common on open eroded slope
- 2 19 *Equisetum pratense*
abundant in rich woods
- 1 20 *Nostriaria* flowers white
local in rich woods
- 1 21 *Myosotis caesiotissa*
rare in wet meadow
- 1 22 *Salix cinerea*
common on edge of forest
and wet meadow
- 1 23 *Carex distans*
common in wet meadow on dense sod
- 1 24 *Poa pratensis* var. *humilis*
abundant in dense sod in wet meadow

Schleswig

157

small tree.

flowers white

flowers blue

shrub 3-4 m tall,
leaves bluish green.

158

1961 Germany

- 41825 *Triglochin palustre*
occasional in wet meadow in dense wood.
- 2 26 *Juncus gerardi*
abundant in dense wood in wet meadow
- 1 27 *Alopecurus geniculata*
abundant in dense wood in wet meadow

May 26 - Gluecksberg
1 28 *Trientalis europaea*
common in beech forest

May 26 - Horstkoppel, near
Neubirchen
in dense beech ~~wood~~ forest
2 29 *Stellaria nemorum* var. *glabra* ^{nudans}
local

1 30 *Carex sylvatica*
common

2 31 *Lonicera europaea*
rare

1 32 *Ranunculus lanuginosus*
common

1 33 *Milium effusum*
common

1 34 *Anemone nemorosa*
abundant

1 35 *Viola montana*
common

1 36 *Melica uniflora*
local

2 37 *Mohringia trinervia*
local

Schleswig

159

~~#~~ rhizomes thread-like
white; flowers white.

flowers white.

flowers white.

flowers bright yellow

erect

rhizome little; dark brown
except white tips.

diffuse; flowers white.

160

1961 Germany

May 26 - Missunde,

on Schleie Förde

41838 Carex stans

common in marsh on edge of fjord

1 39 Myosotis hispida
occasional, local

May 26 - Büttsee

in rather dry sloping meadow,
rather open* 40 Festuca ~~antes~~ ovina v. vulgaris
abundant1 41 Oritrophus purpurea
occasional1 42 Aira caryophyllea
very common1 43 Aira praecox
common in bare spaces
between tufts of other species.2 44 Sagula campestris
very common in dense sod
at foot of slope1 45 Ranunculus celeratus
same - in edge of marsh

same - roadside ditch

46 Saxifraga granulata
common

Schleswig

161

flowers minute, blue.

prostrate

erect, flowers white;
bulblets ~~on~~ at base of
plant pinkish.

May 27 - bus trip Schleswig-Holstein, north, back to Schleswig.

Left the terminal young moraine just west of Schleswig. On flat outwash plain birch is common. *Picea* is planted, soils are violet, as on old moraine. *Populus tremula* appears. scrubby.

Hedges have no *Lysimachia*, not much *Corylus*.

Landscape has become very flat.

Cultivation principally ~~of~~ rye and potatoes.

Practically no forest except in the far distance.

Hedges have no *Corylus*. Silberstedt.

Natural vegetation is Fagus-Quercetum.

Silberstedt Forst. ^{when} ~~now~~ *Fagus*-*Quercus* forest,

much opened up and irregular. some *Carpinus*

shrub layer

Rhamnus frangula

Quercus

Tilia americana

planted *Picea*,

Rubus sp.

Herb layer: o *Anthoxanthum odoratum*
- a *Steridium aquilegum*
Lonicera periclymenum
Stellaria holostea
Campanula
Deschampsia flexuosa
Trientalis europaea
Luzula uliginosa
Coronilla varia
Mianthrium bifolium
Vaccinium myrtillus
Dryopteris spinulosa
~~Matteuccia~~ *Milium effusum*
Dryopteris "spinulosa"
Oxalis acetosella

The *Coronilla varia* forms a dense colony occupying an area a few m² square. (photo)

Soil profile:

4 dm. very dark brown, peaty. below this a dark mottled gray, yellow, dark brown, down to the water table.

Evidently an old *Calluna* profile.

Nearby in a low wet place there is a profile of perhaps 25 cm. of blackish peaty sand and gray mottled with yellow sand and gravel beneath it. Forest here beech, ~~oak~~, alder.

shrub layer
Quercus
Fraxinus
Carpinus
Crataegus
Corylus

Hedges

Carox silvatica
Ranunculus sp.
Viola sp.
Anemone nemorosa
Gentian
Caex sp.
Lonicera europaea
Mercurialis perennis

A black pond with no aquatic veg. nearby.

Terra

Polyodium vulgare common in this region on sand, on north slopes, also on trees.

Hedges of *Prunus spinosa*, *Lambucus*, *Crataegus*, *Balix*, *Lobus mexicana*, *Alnus*, *Quercus*

Schwesing

Anthiscus common here in old moraine, almost absent in outwash plain.

~~Hedgerow~~

A road to n.e. to Engelburg. along this road hedges succeed as the street tree.

Area of oak scrub about 3-4 m. tall, dense, on sand. Some *Rhamnus*, *Populus*, *Crataegus*, *Lonicera* ^{perfoliata}, *Lathyrus* *occidentalis*, *Rhamnus*. Coppiced every 5-6 years. *Fagus* has been eliminated by cutting.

- a *Herb layer* l. *Convallaria majalis*
- a *Anemone nemorosa*
- c *Polygonatum multiflorum*
asterile grass *Holcus mollis*
- c *Pteridium aquilinum*
- la *Luzula*
- lc *Stellaria holostea*
- dc *Anthoxanthum odoratum*
- l *Teucrium*
- la *Maianthemum bifolium*
- Open calluna heath with planted larch, pines, etc. Some very small *Populus* trees.
- Lupinus* sp. *Luzula pilulifera*, *anthoxanthum*, *Juncus squarrosum*, *Deschampsia*

Soil profile in oak scrub
25-35 cm. of pale gray sand,
lower margin very irregular
(appearing scalloped).

Immediately below this several
cm. darkened, dark brown, fading
at once to a dark yellow brown
sand which becomes paler
and mottled downward.
Mottling is dark red-brown
to blackish. Black fine
bits, very irregular.
May be incipient artein.
Entire profile fine sand.

Hassum

north of city a large polder
enclosed by a dyke - 400 years old.

north of this very low
land, fringing the old moraine
Gentle slope down to ~~beach~~
~~marsh~~
divided by low earth wall
with 2 low barbed wire fences
slanting in opposite directions

On walls are *Carex arenaria*,
Elymus arenarius, *Festuca rubra*,
Rumex acetosella, *Carastium* sp.,
Taraxacum, *Hieracium pilosella*.

Meadows between them
have a firm sod, with
much *Ranunculus*, locally
Juncus. Much *Bellis*.

photos

photos

Beyond beach, low walls
of pole, and walls run out
in shallow water for reclamation.

These serve as baffles,
retarding the strong ebb
which would carry out the silt.
~~silt~~ ~~settled~~ on mud in reclamation areas

Iris pseudacorus

Syrinx maritimus

Aster tripolium

Puccinellia

Plantago maritima

Ligustrum maritimum

Festuca rubra

Glaux maritima

Drosera

Lathyrus

Beach

Monochoria maritima

Carex arenaria

Elymus arenarius

The *Syrinx maritimus*
and *Lathyrus* bring about
settling and retention of silt.
Then this is shoveled it is
leveed between parallel ditches.
More silt is deposited in the
ditches. The silt is stirred
up from the bottom in shallow
(Baltic Islands) water by rough
weather.

near Sundershafen Norderstrand I.

Festuca marsh just outside the dykes

Festuca rubra

Agropyron pungens

Artemisia maritima

Puccinellia maritima

Plantago maritima

Limonium communis

Tinglochin maritima

forming a dense ^{low} sod.

On sides of ditches

Obine portulacoides

Scandia

Aster tripolium

This is similar to what was on the land inside the dykes before they were built.

Inside dykes land is 60cm - 1m above mean ht. Roadsides ditches have some water. Very heavy soil. Potentially a *Frasinum*. Some spontaneous *Arenaria* saplings along the ditches. Ulmus, also. *Balix* spp. alone. Barley, Wheat, beets, rape, hay rich meadows, but with much *Ranunculus*, increased by grazing. Cattle and sheep both common.

Dykes covered by a low sod on inside much *Carex canescens* & *Gelid.* Two series of dykes,

the inner called "sleeping dykes", maintained in case outer are breached by waves.

Ponds represent places from which dyke material was removed.

On both sides of the dyke on which the road goes to Norderstrand is a belt of reclaimed land still at about ht. serving as pasture for sheep. *Lathyrus tenuissimus* has been planted here and has spread, proving very ~~useful~~ valuable in spreading up reclamation.

North of this dyke is a large polder, mostly in wet meadow.

Leaving this polder, over very flat land to Hatstett, turn north again.

Meadow land with some grain fields. Marshy ditches, with *Salix*.

Grain fields proportion increase north. Barley, so this must be reclaimed marsh rather than moraine. Land cut by drainage ditches with considerable water. — This is a "Kroog" or polder, dredged off for 400 years. Struckum.

Fields in the knobs are separated primarily by low earth walls. Hedges on these sometimes.

Bredstedt - road crosses an area of old moraine. Cross highest point in Nrd Friesland 28 m. Descend to Borgelum and Ferdelum, still on the moraine, but with marsh (w. ~~old~~ fields) just to left. The road now.

Joins along an old, 15th century dyke. Ditched meadow and fields on both sides. Black & White Holstein-Friesian cattle in abundance. No other kind.

Old houses built on mound for protection against storm tides. Were formerly on island. Now reclamation and building of large dyke now makes this unnecessary, and new houses are on level ground.

Large ditch inside dyke from which material was taken. Road very undulating from being built on peat.

Canal turns inland. carries water from two small rivers.

Bottschlotter See on rt. turn left to main dyke again.

Much of beauty of this flat country is in the thatch-roofed Friesian Islands. (photos) Tiedenswart

Newly reclaimed areas of Fahretoft.

On area exposed by digging for dyke material the old ditch system. pre 1043 exposed, filled by more recent ^{white} mud. (photos)

On this bare ^{white} clay, hardened by sulphates, *Salicornia*, *Spergularia* & *Festuca rubra* are pioneers.

Outside this area is a wide belt of *Puccinellia* sot, separated from it by a ditch and low dyke.

Beyond this is a large area of *Spartina* ^{transversalis} ~~and showing~~ ^{now a} mostly ~~dead~~ ^{died down}. Being drained by lines of tile packed in heather.

Beyond this is an area of dead *Salicornia* on hard clay, with abundant seedlings.

A small patch of *Fucus*
also of *Suaeda* and
Puccinellia ^{distans} ~~maritima~~, *Atriplex*
these all a dm. or so ⁱⁿ across.
a few of *Spartina*, larger.

Beyond this similar area but with dead *Suaeda* as well as *Salicornia*, larger patches of some of same plants.

Artemesia seedlings very abundant. *Poa trivialis* now

Farther out, just inside the main dyke, is an area lower still, with a scattering of dead *Salicornia* and a few *Salicornia* seedlings practically nothing more and some of the area still under water.

North of Fahrerhoff, large areas of "broek" of *Phragmites* sod meadow, with ditches. Grazed by cattle and sheep. A fine loose firm sod.

In very wet areas, solid stands of *Phragmites*.

Inland some barley fields. Large canal lined with *Phragmites*. Roadsides ditches, also.

Back of Ockholmer Koog.

Ockholm, cultivation and meadow.

Enormous area of flat and ditched land.

Stendebeull. Old moraine begins.

West Bordelum.

Turned north on highway.

View to west over koogs, see and the Halligen (islands) on the horizon.

goeharde
Calluna heath with Arnica (photo)

Calluna n.
Erica tetralix
Arnica
Gentia pilosa
Genista anglica
Scorzonera
Potentilla ~~canescens~~ erica
Lyngula multiplo
Ledicularia

Luzula campestris
Ranunculus
Deschampsia flexuosa

In wet place

Martagon
Drosera rotundifolia
Eriophorum
Myrica gale
Salix repens
Carex caespitosa
Molinia
Potentilla erica
Salix cinerea

Calluna
Carex panicoides
Sphagnum
Rhynchospora
Salix aurita
Phragmites
Juncus squarrosum

Turned east
Much flat land, Calluna
heath but largely planted
to pine.

Picea plantations.
Some pastures and rye fields.
Some oak around edges
of pine and spruce plantations.
Goldelund.

Goldelund. buried
Fragment of old
series of profiles in a
sand dune. From superimposed
podzol profile.

Old dune surface
a black layer (from an
Erica ^{strialis} heath) below this a deep
white sand layer, then
black ^{humus} fading to yellow
sand with irregular
bands of black. These quite
thick - only of humus, not of
iron. This quite thick.

The top black layer of this
buried portion is banded
with thin layers of sand -
possibly wind blown.

The *Erica* vegetation may
have been destroyed by
sheep.

Deep in the B horizon
is some iron.

A typical profile of *Ericetum*

above this buried A. a yellow
B about 4 dm. thick with very
thin brown bands, darkening
upward, then about 1 dm. gray
sand, then a thin black layer.
Then a gray layer, bluish
upward. Then another
yellowish gray layer perhaps
15-20 mm. Then gray for 10-15 cm.
to surface.

In second profile are
white spots, ~~probably~~
~~wast water~~, balls of
always associated with
presence of man.

Under a *Populus*-*Quercetum*.

On way back bed ~~Goldelund~~ ^{under gold}
A large peat bog being
dug and stacked up to dry
for burning as fuel.

Another smaller one near
Sollentuna has been dug up quite
a bit and *Criophorum* has come
up in great abundance.

Generally typical level
old moraine landscape.
fields, meadows, hedges
on low walls. Rye
flocks

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Jungiusstr. 6-8

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1961

Germany

May 27, Goslarde, about 5 km.

n.w. of Bredstedt

- 41847 Carex panicoides sand
occasional in wet heath
- 48 Salix repens
common in rather moist sand
heath
- 49 Luzula multiflora sand
occasional in dry heath
- 50 Luzula campestris sand
common in openings in dry heath
- 51 Pedicularis
occasional in moist sand heath

May 27 - newly reclaimed land
south of Fahrtoft

- 52 Cochlearia officinalis
occasional on slopes of dyke
- 53 Poa trivialis
very rare on desiccating clay flat.

May 27. Engelsburg, n.e. Husum.
in coppice of Quercus robur

- 54 ~~Woodland~~ Polygonatum multiflorum?
common
- 55 Luzula campestris:
common in opening

May 27 - Hilbertsdorf Forest,
10 km. w. of Schleswig
in open oak-beech forest

- 56 Cornus suecica
luxuriant colony in
- 57 Dryopteris "spinulosa"

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fruits pink;
stems prostrate to ascending
flower deep rose pink.

slightly fleshy; flower white,
fruit scarcely a not compressed.
prostrate, culms spreading.
Plant purplish.

rhizome white, fleshy;
flowers white with green distal part.

stems erect, in masses;
bracts white, flowers

May 28 - Schleswig - Hamburg
by car.

In Schleswig a *Crataegus*
with bright rose pink fls.
is a common street tree. *Tilia*
is also common.

Just south of Schleswig
the highway to Rendsburg
passes onto the old moraine
landscape - very flat,
no *Corylus* in hedges. *Rye*
is principal crop, with
meadows and pastures.
a mile or two to the east
is the hilly front of the
young moraine.

In the old moraine landscape
here *Spiraea* sp. is a very
important ~~part~~ component
of the hedges, often the entire
hedge.

North of Rendsburg is a
considerable area mostly
planted to *Picea* forests. Some
larch and pine. (n. of Heidbunge)
South of this some larch
and spruce planted in
mixed stands.

Some damage to larch by
late frosts. Unseasonal frosts
are an effective factor in limiting
area of beech, acc. Wantman.

North of Jeverstedt the
hedges have a very mixed

composition, much talus.
Rather little forest.
South of here, some patches
of pine and of oak, but
rather limited. *Quercetum* -
carpinetum, on moist soils.

Then scattered patches
of pine, then more forest
both pine and oak, near
Brammer.

South of this podzols on
slightly higher ground,
violet soils, locally brownish
on slopes, black in depressions.
Mostly in rye, some beets,
some meadows. Hedges very
mixed, much oak and beech
in them.

Moselaff - gardens and
fruit trees around houses
in suburbs.

Neumünster

Bad Oldesloe

The entire trip is through
old moraine landscape.

Some forest north of
Hamburg - largely oak, of
various heights.

Quickborn - Friedrichsgabe
Meadowland with hedges.

Some grain fields - wheat?
Then mostly cultivation.

Then a heath on top of
a small rise.

May 28. Hamburg - Dusseldorf
(caravelle, left side)

Large areas in Hamburg, e. of Elbe, with fairly large lots, small houses, abundant fruit trees, gardens.

W. of Elbe land is intensively cultivated at first in long parallel strips, then in blocks. Most of the houses are clumped in villages.

Then a fair proportion of pine (?) forest (planted) in fairly large to small aggregations of blocks.

This somewhat less southward and some areas of natural oak (?) forest and heather. The pine or spruce forest patches are smaller, but fairly numerous, quite irregular in size and distribution, perhaps 10% or less of total area, increasing to 50% very locally (incl. natural forest and heath). Houses still generally in villages rather than scattered on farm. Soil a light gray to gray-brown sand color.

Visibility becomes zero before the n. German plain is passed.

A few minutes later, still on plain. A large patch of what may be heath, judging from color but laid out in rectangular pattern - possibly forest planting, very young in heath.

Then an abrupt change in pattern of cultivation. Patches smaller, of mostly odd but still geometrical shapes. Orientation not regular any longer, but mixed up! Not much forest. Visibility poor again. Occasional glimpses show this pattern continues but becomes a bit more regular.

About half hour from starting several wooded ridges, close together transverse to course, otherwise landscape mostly cultivated, irregular patches with hedges, some small patches of forest, probably coniferous and doubtless planted (the altitude now such that details are lost.) Visibility poor again; and descent sharply begins. Landscape still mostly cultivated, patches irregular but geometrical or at least angular.

no visibility for a bit, then similar pattern, flat country, a few small bits of forest. Poor visibility again.

Outskirts of Dusseldorf - many neat housing developments and apartment developments, grassy or grain fields between them.

Floodplain of Rhine each channel very green. Forest between east and main channels.

West of Rhine some city development. Then ~~open~~ country about $\frac{1}{7}$ to $\frac{1}{4}$ wooded. City north of small river. Forest on hills, flat tops with some cultivation. Much forest, some subdivisions. Forest obviously carefully managed. blocks clear cut, and in various stages of regrowth. Mostly coniferous but some blocks of beech and possibly *ovalia burpinus*.

Then open fields and housing developments for some distance as airport is approached, then some more forest. Then landed. 4:19.

May 28 - Dusseldorf - Paris.

Flood plains in meanders of Rhine completely cultivated in a regular rectangular pattern.

Visibility bad for 15 minutes or so. Then ok for a short distance. From a very high altitude the country appeared to be a vast mosaic of roughly circular large areas of forest in a matrix of cultivated land and towns. Spacing fairly regular and ~~overlaid~~ or less than diameter of the forests. Then no visibility again.

After about 10 minutes, deeply incised very regular meanders of a river in forested country. Then generally forested country with flat cultivated valley bottoms, about 6 to 8% wooded. Changed gradually to almost completely cultivated and grazed country, only very slightly wooded along streams - gallery forest and a few tiny patches.

Pattern of cultivation rectangular but orientation varies locally.

After about 5 minutes patches of wood become frequent and a large area in middle distance, 10-20% of landscape wooded, locally much less. Fairly large patches, then

May 27 a very large patch just left of course.

Then smaller scattered patches, quite variable in size and perhaps covering 10-15% of country.

Descent to Paris started. More large patches of woods, but not more than 20% of landscape mostly much less.

Poor visibility. Then some fairly large patches of forest (but altitude much lower). 20-30% cover locally, mostly much less. Then a large irregular forest (Fontainebleau?) also others fairly large ones, some locally fairly open. Green fields between them, also open villages.

May 30 - From Orly westward over Versailles a very considerable amount of dense forest. That around Versailles cut up by roads in a very formal and geometric pattern.

About an hour west the clouds cleared away. ^{a Brittany?} Ireland (?) is immediately to the right. The part is green but singularly ~~habited~~^{habited}. No cities or towns are in evidence. The

landscape shows a very pronounced "grain" of parallel beds or strike lines running southwest culminating in a series of parallel rectangles (peninsulas) pointing southwest. Forests are not at all evident. Small mountains may be seen well inland. A few small beaches are scattered along the coast, but it is mostly lined by low sea cliffs.

Farther west the coast swings somewhat north, and there are a few tiny islands.

The upper surface of the clouds at with the sun about 20° up ^{is} can be likened to a symphony in white and powder blue.

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~~Salal
T. M. F.~~

41858

Virginia

June 17 - George Mason High School,
just north of Falls Church
Fagopyrum esculentum
beside road in second growth,
deciduous woods.

June 18 - Great Falls
flowering:

Lysimachia ciliata
Lonicera japonica
Cryptotaenia canadensis
Chrysopogon virginianus
Lantana ovata
Liparis liliifolia
Galium obtusum
Glynnus canadensis?
Cirsaea quadrangularis
Anemone virginica
Trifolium repens
Juncus tenuis
Lepidium virginicum
Dianthus armeria
Apocynum cannabinum
Tephrosia virginiana
Rosa carolina

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erect, flowers white.

June 24 - Powdermill Reserve
birds: Crow Powdermill Run
Kentucky warbler Westmoreland

Cardinal E.
Goldfinch
Titmouse
Morning dove
Cowbird
Robin
House wren
Yellow-billed cuckoo
Black-billed cuckoo
Chipping sparrow
Field sparrow
Red-eyed vireo
Indigo bunting
Hairy woodpecker
Cedar waxwing
Song sparrow
Northern yellowthroat
Chat
Towhee
Golden-winged warbler
Crested flycatcher
Scarlet Tanager

Catskill
Co.
NY

- Mixed hardwood s bottom
Quercus alba ^{near land}
Carya cordiformis?
Acer nigrum
Nyssa sylvatica
Pinus strobus
Platanus occidentalis
Acer rubrum
Quercus rubra
Fagus grandifolia
Magnolia liliiflora var.
Ulmus
Liriodendron tulipifera
Juglans nigra
 Old field with thicket
 o *Tunus serotina*
 a *Populus angustifolia*
 c *Acer rubrum*
 c *Cornus florida*
 o *Nyssa sylvatica*
 c *Fragaria americana*
 r *Rhus typhina*
 o *Acer nigrum*
 c *Lalix nigra* (near stream bank)
 ~ *Bambusa canadensis*
 e-a *Cornus fennica* *Tilia* *Ulmus*
 Meadow parts of field
 a *Chrysanthemum leucanthemum*
 a *Trifolium repens*
 a *Phleum*
 o *Apocynum androsaemum*
 a *Holcus lanatus*
 c *Trifolium pratense*
 a *Eriogon stigosus*

- c *Asclepias syriaca*
 c *Plantago rugelii*
 c *Panicum*
 ea *Melilotus officinalis*

June 25 - Cranberry swamp
 Flat peaty area with
 scrub or dwarf scrub
 with *Rosma*, *Hypericum*
Vaccinium, *Gaultheria*,
Coptis, *Rubus hispida*,
Solidago sp., *Symplocarpus*,
 etc. growing on a mat
 of *Polytrichum* and locally
Sphagnum. *Coptis*
 scattered, locally
 abundant emergents
 of *Nemopanthus*, *Viburnum*
cassinoides, *Polygonatum*
Osc. hemlock, *Pinus strobus*,
Picea,

192

Labels
typed

1-

June 25 - Powdermill Nature
Preserve, Powdermill Run
Westmoreland Co. Penna.

Mixed deciduous forest
on flood plain.

4/1959 *Mitchella repens*
abundant

1 60 *Fragaria*
common

June 25 - Cranesville Swamp
West. Va.

1 61 *Fragaria*
occasional ~~as~~ in dwarf
scrub around periphery
of swamp on thin dry
sandy soil.

193

prostrate; flowers white,
purple outside; fruit scarlet.

194

195

Kulani - if you want to
go south beyond Kulani,
you might make it. Bad spot begin!
very short - if wet no good.

Hilina OK.

Rapolo Beach C.C.

Ocean Rd. -
can make it but it
does not want

Should do in reverse order & reach C. Then
via green lakes and
back track to Rapolo.

Up to Overtown above Kipukha

2214 1972
A year ago today
I was at J.A.

stempeln an den Unterzeichneten zu senden. Briefporto bitte beifügen.

Fortsetzung von Seite 2					
an	km	ab	Strecken-Nr. des Kursbuches	ab	Anschlüsse nach
		Koblenz Hbf	(249c)	14.00	Niederlahnstein 14.08 (E 14.21 St Goarshausen 14.49)
13.45			(248q)	14.10	Mayen Ost 15.12
			(263)	D 14.10	Cochem [Mos] 14.48 Trier 15.49 Luxem- bourg 17.05 Reims 20.56 Paris Est 22.53
			(263)	14.17	Hatzenport 14.56
			(249)	14.45	Boppard 15.03 Bingerbrück 15.40 (D 15.48 Bad Kreuznach 16.01) Bad Münster a St 16.10 Kaisers- lautern 17.01 Homburg [Saar] 17.34 Saarbrücken 18.04)
			(195)	15.18	Bad Ems 15.46 Limburg [L] 16.34 Anschluß nach Neustadt [Wstr]: an E 17.46
		Rüdesheim [Rh]	(250)	E 15.20	Eltville 15.38
14.51			14.52		
		Wiesbaden Hbf	(195b)	15.27	Niedernhausen [Ts] 15.55 (16.00 Camberg [Nass] 16.23)
15.22			(195e)	15.28	Bad Schwalbach 16.10
			(317)	E 15.35	Mainz 15.44 (15.53 Rüsselsheim 16.10) Gr Gerau 16.04 Darmstadt 16.17
			(2195/60)	E 16.00	Schlangenbad 16.32
			(250b)	E 16.01	Frankfurt-Höchst 16.27 (16.38 Bad Soden [Ts] 16.52 und a 17.18, 17.40 Königstein [Ts] 17.52, 18.11)
				(249a)	Worms 16.52 Ludwigshafen [Rh] 17.12 (D 17.24 Mannheim 17.30)
		Frankfurt[M]Hbf	(196h)	16.11	a 16.20, 16.41 Bad Hom- burg 16.36, 16.42, 17.06
16.06			(315a)	D 16.12	Mannheim 17.02 Kaiserslautern 18.00 Saarbrücken 18.48 Metz 19.50 († 19.54 Bar-le-Duc 20.48 Paris Est 23.46)
			(315)	D 16.15	Heidelberg 17.15 Karlsruhe 17.52
			(196)	D 16.15	Baden-Baden 18.18 Offenburg 18.43 Freiburg [Brsg] 19.24 Basel SBB 20.30
			(315a)	E 16.17	Friedberg [Hess] 16.43 B Nauheim 16.51 Gießen 17.23 (17.34 Marburg [L] 18.15) Siegen 18.49
			(196g)	a 16.20	Goddelau-Erfelden 16.55
			(315)	E X 16.21	Biblis 17.13 Lampertheim 17.25
			(192a)	X 16.22	c 16.41 Usingen 17.28 Δ 17.53
			(192)	X 16.22	E 16.48 Weinheim [Bgstr] 17.20, 17.51
			(196h)	16.26	E 16.35 Offenbach [M] 16.34, 16.46
			(192)	c 16.40	Hanau 16.59
			(196)	F 45 17.14	† 16.40 Wächtersbach 17.48, 18.12 (a 17.51, 18.18 Bad Orb 18.01, 18.28)
				"Roland"	Kronberg [Ts] 16.54
					a 16.59 Fulda 19.20 Bebra 20.45
					Gießen 17.59 Kassel 19.28
					Göttingen 20.21 Hannover 21.23
					Δ Bad Homburg umsteigen
		AschaffenburgHbf	(416d)	b 17.04	X 17.42 Miltenberg 18.11, 18.43
16.50			(416f)	a 17.15	Mömlingen Bf 17.55
			(416)	E 17.23	Lohr Bf 18.00
			(416f)	17.57	Höchst [Odwl] 19.04
		Gemünden [M]	(192)	17.52	Jossa 18.19 (19.45 Brückenau Bad 20.10 Wildflecken 20.42)
17.38			(416)	E 18.16	Karlstadt [M] 18.27
			(418d)	18.26	Hammelburg 19.12 Bad Kissingen 19.44
		Würzburg Hbf	(322)	D 18.18	Lauda 18.55 (E 19.10 Bad Mergent- heim 19.20 Crailsheim 20.37)
18.08			(419)	E 18.24	Heilbronn 20.09
			(415)	E 18.24	Schweinfurt 19.00 Bamberg 19.54
			(415)	E † 18.24	Lichtenfels 20.26 (21.10 Coburg 21.36)
			(415)	E 18.24	Neuenmarkt-Wirsberg 21.22
			(416)	E 18.24	(22.01 Bayreuth 22.32) Hof 22.32
			(416)	E 18.24	Steinach 19.25 (19.41 Rothenbg odT 20.02)
			(416)	E 18.24	Ansbach 19.52 Treuchtlingen 20.38
			(416)	X 18.58,	Eichstätt 21.06 Ingolstadt 21.33
			(416)	E 19.48	19.27 Kitzingen 19.25, 19.54
					Neustadt [Aisch] 20.31 Fürth [Bay] 20.56

Fortsetzung Seite 4

Barbuch - Deine Reisekasse

an	km	ab	Strecken-Nr. des Kursbuches	ab	Anschlüsse nach	an
			Nürnberg Hbf	(420)	D 19.46 Dombühl 20.53	
19.27		19.42		(417)	E 19.50 Neumarkt [Opf] 20.18 Regensburg 21.08	
					Plattling 22.00 (22.06 Passau 22.49)	
	137.2			(414)	E 19.50 Erlangen 20.30 Forchheim [Opf] 20.52	
				(423)	E 19.51 Neukirchen 20.42 Weiden [Opf] 21.51	
				(417c)	19.55 Feucht 20.10	
				(413)	19.56 Schwabach 20.21 Pleinfeld 20.57	
				(413)	E 20.29 Treuchtlingen 21.20 Donauwörth 21.57	
				(423)	21.00 Amberg 22.52 (bus c 22.55 bus a 23.15	
				(421)	E 21.55 Schnabelwaid 23.04 Bayreuth 23.23	
			Augsburg Hbf	(411a)	X 21.20 c 22.20 Aystetten 21.55, 22.55	
21.08		21.12		(404a)	† 21.40 23.10 Landsberg [Lech] 22.41, 0.22	
				(411d)	† 21.51 a 22.35 c 23.25 Schraben-	
	61.9			(410c)	hausen 22.42, 23.26, 0.16	
				(411a)	21.50 Gessertshausen 22.14	
				(410c)	a 22.20 c 23.20 Welden 23.15, 0.15	
				(405)	22.34 Dinkelscherben 23.11	
					23.47 Buchloe 0.40	
			München Hbf	(413a)	22.10 Dachau Bf 22.30	
21.53		22.28		(401b)	22.26 Starnberg 22.56 Tutzing 23.10	
				(413)	E † 22.30, 0.10 Wolnzach Bf 23.20, 1.12	
				(428)	D 22.35 Rosenheim 23.18 Kufstein 23.44	
					Innsbruck 1.24 Bolzano/Bozen 4.43	
					Merano/Meran 5.42	
				(428)	D 22.35 Verona 6.54 Venezia SL 10.13	
				(428)	D 22.35 Verona 6.54 (bus 7.13 Milano C 9.10)	
					Bologna C 8.46 (9.03 Rimini 10.18)	
					Ancona 11.52) Firenze SMN 10.34	
					Roma T 14.40	
				(428)	D 22.42 Prien 23.45 Traunstn 0.07 Freilassing 0.33	
					Wels 2.49 Linz 3.12 Wien West 6.20	
				(410a)	22.46 Nannhofen 23.24	
				(424a)	22.52 Freising 23.35	
				(401a)	22.58 Herrsching 23.48	
				(402)	E So 23.00, 23.10 Weilheim [Obb] 23.41, 0.06	
				(402)	E So 23.00 Murnau 23.58	
				(2429/3)	Garm-Partenk 0.28 Mittenwald 0.56	
				(406a)	Bad Wiessee 0.16 Tegernsee 0.35	
				(424)	23.12 Fürstenfeldbruck 23.43 Geltendorf 0.11	
				(427)	E 23.20 Landshut [Bay] 0.20	
				(2429/40)	23.29 Dorfen Bf 0.34 Mühldorf [Obb] 1.03	
				(429a)	0.05 Wolfratshausen 0.41 Kochel 1.45	
					Holzkirchen 0.55	
			Salzburg Hbf			
0.12		0.50				
			Badgastein			
2.48		2.52				
			Spittal-Millstätt	6.20	Lienz 7.42	
3.45		3.51			S Candido/Innichen 9.20	
			Villach Hbf	D	4.40 Velden a W 4.53 Pötschach a W 5.00	
4.22		4.50		Ex	Krumpendorf 5.06 Klagenfurt 5.12	
	103				Tarvisio 5.30 Udine 7.45 Trieste C 9.30	
					Weitere Halte zwischen Villach und Ljubljana:	
					Rosenbach an 5.16 Jesenice [Aßling] an 5.53	
					Lesce Bled [Veldes] an 6.44 Kranj [Krainburg] an 7.11	
			Ljubljana [Laibach]		11.03 Rijeka [Fiume] 14.42	
7.48	142	8.30			Weiterer Halt zwischen Ljubljana und Zagreb:	
					Zidani Most 9.34	
			Zagreb [Agram]		Weitere Halte zwischen Zagreb und Beograd:	
10.57	142	11.12			Banova Jaruga 12.25 Novska 12.43 Slav Brod 13.52	
					Vinkovci 14.50	
			Beograd [Belgrad]	§	18.35 Sofija OEZ 5.10 Istanbul OEZ § 22.35	
17.01	244	18.20		§	ab München nur Mo, Mi, Sa	
			Nis			
22.02	960	22.22			Weiterer Halt zwischen Nis und Athen:	
					Thessaloniki [Saloniki] an OEZ 9.39	
			Athen			
					OEZ 22.09	

„Ihr Zug-Begleiter“ erscheint monatlich nach dem neuesten Stand des Fahrplans. Inhalt ohne Gewähr! Herausgegeben in Zusammenarbeit mit der Deutschen Bundesbahn. Verlag Kultur u. Wissen GmbH., Abt. Fahrplan, Frankfurt/M., Münchener Str. 54, Tel. 331214/331196. Druck: Phil. L. Fink KG., Groß-Gerau

„Ihr Zug-Begleiter“

Jugoslavia-
Express

D 264

1. 2.

Den Haag - Emmerich - Köln - Bonn - Wiesbaden - Frankfurt [M] - Nürnberg - München - Salzburg - Villach - Beograd [Belgrad] - Athen

Den Haag - München

1. 2. Bruxelles - Venezia

2. Aachen - Meran

1. 2. München - Sofija

1. 2. München - Istanbul (ab München Mo, Mi, Sa)

1. 2. München - Trieste

1. 2. München - Beograd [Belgrad]

1. 2. München - Athen (ab München Di und Fr)

1. (Wien -) Beograd - Athen (ab Beograd Mo und Fr)



Bundeshauptstadt Bonn: Bundeshaus — Rheinseite

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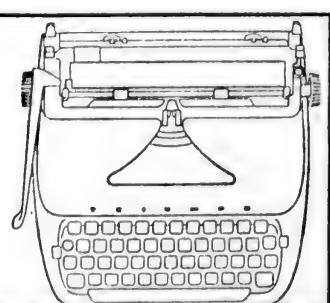


Wir wünschen Ihnen eine angenehme Reise!
We wish you a pleasant journey!

„Ihr Zug-Begleiter“ unterrichtet Sie auf den nachfolgenden Seiten über die Fahrzeiten und Anschlußmöglichkeiten dieses Zuges.



Die „Handschrift“ moderner Menschen



Ausgabe: Mai 1961 (gültig bis 27. Mai 1961)

BITTE MITNEHMEN!

Jugoslavia-
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D 264

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Frankfurt [M] - Nürnberg - München - Salzburg -
Villach - Beograd [Belgrad] - Athen**

Erläuterungen: **TEE** = Trans-Europ-Express (T), F = Fernschnellzug, D = Schnellzug, E = Eilzug, **→** = Triebwagen, X = werktags, † = sonn- u. feiertags, So = sonntags, Mo = montags, Di = dienstags, Mi = mittwochs, Do = donnerstags, Fr = freitags, Sa = sonnabends, a = X außer Sa, b = täglich außer Sa, c = † u. Sa, o = tägl. außer So, ♦ = nur 1. Kl., () oder — = umsteigen, **RE** oder **RE** = Kurs- bzw. Liegewagen, **S** = Schlafwagen, **OB** = Omnibuslinie (Bahn, Post oder Privat), weitere Buchstaben u. Zeichen s. Fußnoten. Die Fahrpreise werden nicht nach den km-Angaben in der Zuglaufspalte, sondern nach besonderen Tarifentfernung berechnet. Bei den angegebenen Anschlüssen ist in einigen Fällen eine Umwegkarte erforderlich.

⊗ = Postsparkassendienst Tag und Nacht in Bahnhofsnähe.

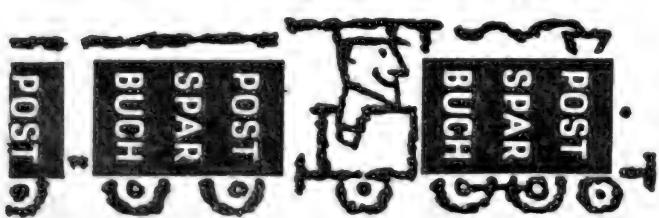
an	km	ab	Strecken-Nr. des Kursbuches	Anschlüsse nach	an
Den Haag SS					
	148	8.32		Weitere Halte zwischen Den Haag und Emmerich: Utrecht CS an 9.15 / ab 9.20 Arnhem OB an 9.58 / ab 10.14	
Emmerich OB					
10.37	60.8	10.39	(235)	X 11.10, 12.06 Empel-Rees 11.30, 12.21 (RE 12.25 Bocholt 13.15) Wesel 12.10, 12.48	
Oberhausen Hbf					
11.21	7.6	11.31	(227) (227) (227)	E 11.26 Essen 11.43 Bochum 11.56 Witten 12.13 Hagen 12.32 (D 12.57 Kassel 16.16) Bochum 11.56 (E 12.01 Dortmund 12.20 — E 12.31 Hamm [W] 12.51 Soest 13.18 Paderborn 14.10) Hagen 12.32 (RE D 12.57 Arnsberg [W] 13.51 Bestwig 14.21 Brilon Wald 14.44 B Wildungen 16.42) Bottrop 11.41 Dorsten 12.01 Coesfeld [W] 12.32 Rheine 13.14 Spellen [Nrh] 12.10 Gelsenkirchen Zoo 12.17 Duisburg-Ruhrort 12.10 E-Altenessen 12.07 Gelsenkirchen 12.17 Wanne-Eickel 12.26 Herne 12.33 Dortmund 12.53 Hamm [W] 13.23 (13.54 Münster [W] 14.39 und D 15.03 Osnabrück 16.09 Bremen 17.38 Hamburg 19.07 Bielefeld 14.15 Herford 14.30 Minden [W] 14.57 Hannover 15.42 Braunschweig 16.54 Moers 12.31 Recklinghausen 13.01	
Duisburg Hbf					
11.39	23.7	11.41	(244) (232a) (227)	E 11.46 Krefeld 12.02 (12.45 Kleve 14.13) Viersen 12.16 M Gladbach 12.25 Lindern 12.54 Aachen 13.36 Duisburg-Wedau 12.08 12.56 Kalkum 12.28, 13.08	
Düsseldorf Hbf					
11.58	40.0	12.01	(229) (2245/21) (227) (228) (2246/3)	12.12 Sol-Ohligs 12.36 Remscheid 13.09 Elmpt Markt 13.58 Roermond Hbf 15.02 Leverkusen-Wiesdorf 12.41 Wuppertal-Elberfeld 13.14 Viersen, Augustaplatz 14.00	
Köln Hbf					
12.28	35.3	12.44	(250) (240b) (240) (249) (247)	E 12.36 Troisdorf 12.55 Königswinter 13.13 Linz [Rh] 13.30 Neuwied 13.51 N'lahnstein 14.19 Bergisch Gladbach Stadtmitte 13.08 Overath 13.31 Gummersbach X 14.20 Brühl 13.06 Düren 13.14 Aachen 13.39 Liège [Lüttich] G 14.36 Bruxelles M 15.47 (D 16.00 Oostende 17.15) (228) E X 12.51 E 13.15 Opladen 13.10, 13.34 (251) E 12.55 Au [Sieg] 14.05 Betzdorf [Sieg] 14.27 (248) Sa 13.01 E 13.50 Euskirchen 13.58, 14.29 (248) E Sa 13.40 E 13.50 Jünkerath 15.25, 15.33 Gerolstein 15.42, 15.51	
Bonn					
13.06	59.3	13.08	(249) (247e)	13.25 Bad Godesberg 13.32 Remagen 13.48 (13.56 Bad Neuenahr 14.12) Andernach 14.16 X 13.34 Rheinbach 14.06 Euskirchen 14.22	

Fortsetzung Seite 3

Fortsetzung von Seite 2

an	km	ab	Strecken-Nr. des Kursbuches	ab	Anschlüsse nach	an
		Koblenz Hbf	(249c)	14.00	Niederlahnstein 14.08 (E 14.21 St Goarshausen 14.49)	
13.45	63.1	13.53	(248q) (263)	14.10	Mayen Ost 15.12 Cochem [Mos] 14.48 Trier 15.49 Luxemburg 17.05 Reims 20.56 Paris Est 22.53	
			(263) (249)	14.17	Hatzenport 14.56 Boppard 15.03 Bingerbrück 15.40	
				14.45	(D 15.48 Bad Kreuznach 16.01 Bad Münster a St 16.10 Kaiserslautern ♂ 17.01 Homburg [Saar] 17.34 Saarbrücken 18.04)	
			(195)	15.18	Bad Ems 15.46 Limburg [L] 16.34 ♂ Anschluß nach Neustadt [Wstr]: an E 17.46	
		Rüdesheim [Rh]	(250)	E 15.20	Eltville 15.38	
14.51	30.2	14.52				
		Wiesbaden Hbf	(195b)	15.27	Niedernhausen [Ts] 15.55 (16.00 Camberg [Nass] 16.23)	
15.22	41.4	15.29	(195e) (317)	15.28	Bad Schwalbach 16.10 Mainz 15.44 (15.53 Rüsselsheim 16.10)	
			(2195/60) (250b)	15.35	Gr Gerau 16.04 Darmstadt 16.17 Schlangenbad 16.32 Frankfurt-Höchst 16.27	
				16.00	(16.38 Bad Soden [Ts] 16.52 und a 17.18, 17.40 Königstein [Ts] 17.52, 18.11)	
			(249a)	16.01	Worms 16.52 Ludwigshafen [Rh] 17.12 (D 17.24 Mannheim 17.30)	
		Frankfurt [M] Hbf	(196h)	16.11	a 16.20, 16.41 Bad Homburg 16.36, 16.42, 17.06 Mannheim 17.02 Kaiserslautern 18.00	
16.06	46.2	16.16	(315a)	D RE ♦ 16.12	Saarbrücken 18.48 Metz 19.50 (♦ 19.54 Bar-le-Duc 20.48 Paris Est 23.46)	
		Frankfurt/M Sitz der Adler-Werke	(315)	D 16.15	Heidelberg 17.15 Karlsruhe 17.52 Baden-Baden 18.18 Offenburg 18.43	
			(196)	D 16.15	Freiburg [Brsg] 19.24 Basel SBB 20.30	
			(315a)	E 16.17	Friedberg [Hess] 16.43 B Nauheim 16.51	
			(196g)	a 16.20	Gießen 17.23 (17.34 Marburg [L] 18.15)	
			(315)	b 16.21	Siegen 18.49 Goddelau-Erfelden 16.55	
			(192a)	X 16.22	Biblis 17.13 Lampertheim 17.25	
			(192)	X 16.22	c 16.41 Usingen 17.28 Δ 17.53	
			(196h)	16.26	E 16.48 Weinheim [Bgstr] 17.20, 17.51	
			(192)	c 16.40	E 16.35 Offenbach [M] 16.34, 16.46	
			(196)	F 43 RE ♦ 17.14	Hanau 16.50, 16.59 † 16.40 Wächtersbach 17.48, 18.12 (a 17.51, 18.18 Bad Orb 18.01, 18.28)	
					Kronberg [Ts] 16.54 a 16.59 Fulda 19.20 Bebra 20.45	
					Gießen 17.59 Kassel 19.28 Göttingen 20.21 Hannover 21.23	
					Δ Bad Homburg umsteigen	
		Aschaffenburg Hbf	(416d)	b 17.04	X 17.42 Miltenberg 18.11, 18.43	
16.50	51.6	16.52	(416f)	a 17.15	Möllingen Bf 17.55	
			(416)	E 17.23	Lohr Bf 18.00	
			(416f)	17.57	Höchst [Odw] 19.04	
		Gemünden [M]	(192)	17.52	Jossa 18.19 (19.45 Brückenau Bad 20.10	
17.38	37.7	17.40	(416)	18.16	Wildflecken 20.42)	
			(418d)	18.26	Karlstadt [M] 18.27	
					Hammelburg 19.12 Bad Kissingen 19.44	
		Würzburg Hbf	(322)	D 18.18	Lauda 18.55 (E 19.10 Bad Mergentheim 19.20 Crailsheim 20.37)	
18.08	102.2	18.17	(419)	E 18.24	Heilbronn 20.09 Schweinfurt 19.00 Bamberg 19.54	
				E 18.24	Lichtenfels 20.26 (21.10 Coburg 21.36)	
			(415)	E 18.24	Neuenmarkt-Wirsberg 21.22 (22.01 Bayreuth 22.32) Hof 22.32	
			(415)	E 18.24	Steinach 19.25 (19.41 Rothenbg odt 20.02)	
			(416)	E 18.24	Ansbach 19.52 Treuchtlingen 20.38	
			(416)	E † 18.24	Eichstätt 21.06 Ingolstadt 21.33	
			(416)	X 18.58,	19.27 Kitzingen 19.25, 19.54	
			(416)	E 19.48	Neustadt [Aisch] 20.31 Fürth [Bay] 20.56	

Fortsetzung Seite 4



Dein Postsparbuch - Deine Reisekasse

FLORISTISCH-SOZIOLOGISCHE ARBEITSGEMEINSCHAFT

(23) Stolzenau/Weser, 9. Mai 1961
Schinnaer Landstr. 6
Fernruf 353

2. Rundschreiben

an die Teilnehmer der Pflanzensoziologen-Tagung in Schleswig.

Zu der vom 25. - 27. Mai 1961 in Schleswig stattfindenden

Pflanzensoziologen-Tagung

mit den anschließenden Exkursionen durch die verschiedenen Diluvial- und Alluvial-Landschaften Schleswigs haben sich über 100 Teilnehmer aus dem In- und Auslande gemeldet.

Die Tagung beginnt am Donnerstag d. 25. Mai 1961 um 9 Uhr c.t. in der Aula der städtischen Mittelschule (Bruno-Lorenzen-Schule) an der Allee (am Chemnitz-Bellmann-Denkmal; Parkplatz vor der Jugendherberge).

Vortragsfolge:

Dr. e.h. Willi Christiansen, Kiel: Die pflanzengeographische Sonderstellung Helgolands.

Dr. Helmut Freitag, Potsdam: Flora und Vegetation des Stechlin-Sees.

Dr. Uwe Jensen, Kiel: Ökologische Eichstufen in natürlicher oligotropher Moorvegetation und ihre Zusammenfassung zu ökologischen Stufenkomplexen. Die Ursachen der Artenarmut der ombratrophen Moorvegetation.

Dr. Heinz-Dieter Krausch, Potsdam: Vorschläge für die Gliederung der mitteleuropäischen Sand-Trockenrasen.

cand. Friedrich-Wilhelm Röpke, Kiel: Die Buchenwaldgesellschaften Schleswigs.

Kreisbeauftragter für Naturschutz und Landschaftspflege und Bauer Hans Möller, Schwesby: Einführung in die schleswigsche Landschaft anhand farbiger Lichtbilder.

Exkursionen:

25. Mai 15 Uhr Wanderung durch den Tiergarten zum Studium verschiedener Waldgesellschaften. Treffpunkt: vor Schloß Sottorp.

20³⁰ Uhr (Mittelschule) Vortrag Prof. Dr. Ernst-Wilhelm Raabe, Kiel: Eine Einführung in die Vegetationsgrundlagen Schleswig-Holsteins.

26. Mai 8 Uhr. Treffpunkt: Schleihallenparkplatz.

Exkursion an die schleswigsche Westküste: Silberstedt, Kratt, Engelsburg, Husum, Schobüll Strand, Nordstrand.

13 - 14 Uhr Mittagspause Norderhafen. Weiterfahrt durch die Koge nach Fahretoft, Fahretoft Koog, Bordelumer Heide, Jordelund. Rückkehr nach Schleswig gegen 19³⁰ Uhr.

Beisammensein der Teilnehmer im Wintergarten der Schleihalle (zwanglose Diskussionen).

27. Mai 8 Uhr ab Schleswig, Schleihallenparkplatz.

Fahrt durch die Jungmoränen-Landschaft von Schwansen und Angeln: Bültsee, Missunde, Schwansburg, Horstkoppel, Westerholz.

13,30 - 14,20 Uhr Mittagspause.

Langballigau, Glücksburg.

Rückkehr nach Schleswig gegen 19 Uhr.

Meldung und Beitrag:

Die große Teilnehmerzahl macht die Einzahlung der Exkursionskosten (Autobus) in Höhe von 18,50 M bis zum 18. Mai 1961 auf das Postscheck-Konto Hannover Nr. 136555 der Floristisch-soziologischen Arbeitsgemeinschaft unbedingt notwendig.

Benutzung von Privatwagen ist leider ausgeschlossen.

Teilnehmer der Tagung, die nur die Vorträge, aber nicht die Autobus-Exkursionen mitmachen, zahlen nur 1,-- M Tagungsbeitrag. Die Teilnahme nur an der Autobus-Exkursion am 26. Mai kostet 9,-- M, nur am 27. Mai 8,-- M.

Mit der Beitragszahlung bitten wir zugleich angeben zu wollen, wer an dem gemeinsamen einfachen Mittagessen am 25. und am 26. Mai teilnehmen will. Die Kosten dafür sind nicht in den oben genannten Exkursionskosten enthalten.

Ein Quartier-Nachweis, vermittelt durch das Städtische Verkehrsbüro, Schleswig, Stadtweg 26, ist beigefügt (sofern Unterkunft bestellt worden ist).

Evtl. Abbestellungen von Quartieren können ohne Kosten für den Gast nur dann berücksichtigt werden, wenn sie unmittelbar an das Städtische Verkehrsbüro Schleswig gerichtet werden und dort spätestens bis zum 19. Mai eintreffen. Eine Mitteilung an unsere Arbeitsgemeinschaft, daß die Teilnahme an der Tagung nicht erfolgen kann, gilt nicht als Quartier-Abbestellung.

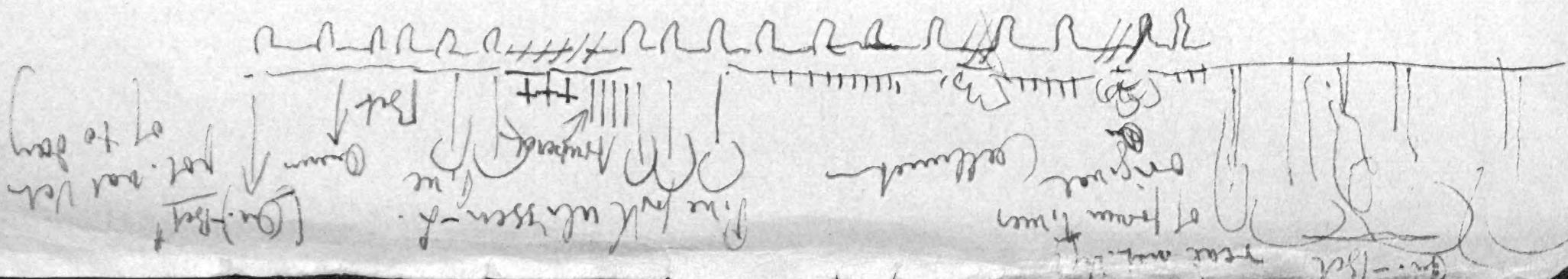
Den Teilnehmern, die mit dem Zuge fahren, wird empfohlen, sich sehrzeitig am Heimatbahnhof ein Formular für Fahrpreisermäßigung (33 1/3 %) für Lehrgangsbesucher abzuholen und das ausgefüllte Formular zum Abstempeln an den Unterzeichneten zu senden. Briefporto bitte beifügen.

Mit freundlichen Grüßen und Auf Wiedersehen in Schleswig

(Tüxen)

Anlagen:

- 1 Quartierschein
- 1 Zahlkarte



Kulani - if prism works
+ spots beyond Kulani,
might make it. bad spot beyond
way school - if wet no good.

Hilina OK.

Rapohoa Beach lots

Ocean Rd. -
can make it out HI.
does not want
should do in reverse order to K. Beach lot then
via green lakes and
bad track to Rapohoa.

Up to overwork above Kipukio

82714 # your number dog
yes your project
Loyalty J.L.

